An Analysis of Opportunities within a UK Biodiversity Credit Market built on the Biodiversity Net Gain 3.1 Metric

Picture of WWT Steart Marshes from the Wildfowl & Wetlands Trust

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1.0 Introduction

1.1 Introduction

The increasing presence of anthropogenic climate change has pushed nations towards sustainable alternatives in all sectors. One of the main contributors to climate change, energy production, is at the forefront of this transition. Ambitious global and national targets are set to see an increase in renewable energy production, both in the terrestrial and marine environment. With biodiversity in these habitats being degraded from centuries of exploitation, legislation is required to ensure this transition is sustainable for both humans and the environment. One pathway being explored is the use of a Biodiversity Credit Market (BCM) to ensure developers are offsetting any impacts to the natural environment and contributing towards the recovery of biodiversity. With changing policy comes new opportunities, by switching to a nature-positive economic model there is potential for over $10.1 trillion of business opportunities (World Economic Forum, 2022). This report aims to identify the potential opportunities and challenges of restoring intertidal and terrestrial habitats in the UK's Biodiversity Net Gain (BNG) metric and how they could be used to produce Biodiversity Units (BU) for a BCM.

1.2 Mitigation and compensation

In Europe, countries have begun to adhere to the mitigation hierarchy. The mitigation hierarchy requires developers to reduce the impact of their development to a net zero loss (Figure 1). As of 2007, European Union (EU) developments that are located within the Natura 2000 network of protected areas are required to adhere to compensatory measures which can lead to a net gain to the biodiversity (Briggs, Hill and Gillespie, 2009; Maestre-Andrés et al., 2020). Although this legislation aims to minimise the impacts of developments to "net zero", there is a need to "give back" to the natural environment to aid recovery.

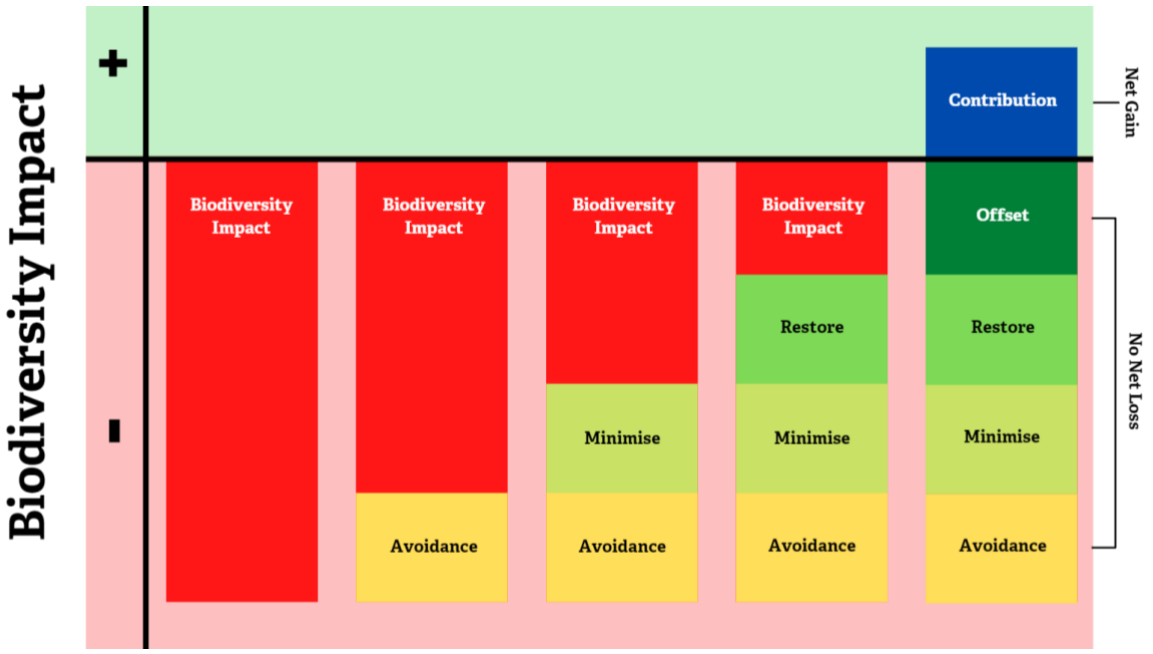

Figure 1: *The stages of the Mitigation Hierarchy and Net Gain displayed visually. To achieve a "No Net Loss" to the site's biodiversity all four steps should be taken. To achieve "Net Gain" additional "contributions" must be made. Figure adapted from Natural England, 2021.*

1.3 Biodiversity Net Gain

Biodiversity Net Gain (BNG) was introduced by the British Government due to a need for restoring biodiversity. Exponential growth in population, development and resource demand has left the biodiversity in a significantly poor state; both globally and nationally. With the need to improve biodiversity, alongside increasing development, BNG was introduced in the 2021 Environment Act which will require all developments under the Town and County Planning Act (TCPA) and the Nationally Significant Infrastructure Project (NSIP) scheme to leave the natural biodiversity in a 10% better state than what it was prior to development, a 10% "net gain" (Figure 1) (Department for Environment, Food and Rural Affairs, 2022b; Planning Advisory Service, 2021). BNG is set to come into policy around November 2023.

To measure a gain to the environment quantitively, a metric has been developed to measure the amount of net gain or net loss a development or restoration project will have on biodiversity. The current metric, BNG 3.1, includes both terrestrial and intertidal habitats but not marine. Marine habitats are included in a separate policy, Marine Net Gain (MNG), due to the more complex issues associated with that environment. As MNG has not been formed and the use of a metric in MNG is not certain (Department for Environment, Food and Rural Affairs, 2022a), BNG will be the main focus of this report. It is important to note that BNG does not replace any environmental legislation, processes such as the mitigation hierarchy (Figure 1) will still be in place. By adhering to other policies that minimise a developers impact on biodiversity they will therefore minimise the amount of restoration required to achieve a 10% net gain in BNG policy.

1.4 Biodiversity Credit Market

With BNG policy expected in 2023, a greater understanding of how a development will need to create/enhance habitats to produce a 10% net gain is needed. Furthermore, can a developer benefit from net gain policy and work with others to ensure BNG is both sustainable for the environment and future developments. This is where the BCM can be applied. The BCM is an emerging market proposition in which BU obtained from restoration, in the UK this is calculated by the BNG metric, could have an economic value which can be bought or sold to other developers (Ecosystem Marketplace, 2015).

Biodiversity credits are an economic incentive that can finance actions to aid the recovery of biodiversity (The Biodiversity Consultancy, 2022). The credits will only apply to contributions that result in a net gain to the natural environment (Figure 1). These can be acquired by either creating or selling BU. The current knowledge of BCM has formed from two decades of practise. The World Economic Forum (2022) suggested that a BCM is added to the Mitigation Hierarchy in a way that is similar to "net gain" by only applying to the positive biodiversity impact actions.

An example of ongoing biodiversity credit trading is in the United States of America with the Wetland Mitigation Banking Program (WMBP). This programme allows developers who have accumulated "debits" (impact on the environment) to buy "credits" (restoration) to offset any impacts they may have on wetlands. It also allows land owners or conservation bodies

that own the area of a restored, enhanced or created wetland to earn “credits” depending on the size and scope of the project (United States Department of Agriculture, 2022). Buyers can purchase credits off of this to ensure their development achieves a “net zero” or “net gain” impact to the local biodiversity. The WMBP was established in 2014 and has been running successfully since 2016 and funded by the United States Department of Agriculture’s (USDA) Natural Resources Conservation Service (NRCS). This habitat banking scheme only focuses on one habitat, wetlands, meaning the worth of a credit is not too complex. This system may not be appropriate for the UK due to the range of habitats that are found within BNG policy.

2.0 Methodology

The overarching objective for this report was to identify habitats of restoration potential for Ørsted and investigate how different functions affected the BNG metric BU output. The total units the BNG metric produced was multiplied by the predicted worth of a BU to estimate the value of restoration efforts. The BU monetary values used in this investigation were obtained from Ørsted.

2.1 Understanding the Biodiversity Net Gain metric

Prior to the main analysis of BU generation for BCM, pilot runs of habitat restoration in the BNG 3.1 Metric were done to understand how the metric’s multipliers functioned. The offsite "Spatial Risk” multiplier was tested to identify the impact it had on the total units earned. This multiplier had six categories, three for intertidal habitats and three for terrestrial habitats. The spatial risk category for intertidal developments:

- Compensation inside same Marine Plan Area, or deemed to be sufficiently local, to site of biodiversity loss (multiplier of 1)
- Compensation outside same Marine Plan Area but in neighbouring Marine Plan Area (multiplier of 0.75)
- Compensation outside Marine Plan Area of impact site and beyond neighbouring Marine Plan Area (multiplier of 0.5)

Spatial risk category for terrestrial developments:

- Compensation inside LPA or NCA, or deemed to be sufficiently local, to site of biodiversity loss (multiplier of 1)
- Compensation outside LPA or NCA of impact site but in neighbouring LPA or NCA (multiplier of 0.75)
- Compensation outside LPA or NCA of impact site and beyond neighbouring LPA or NCA (multiplier of 0.5)

Another feature of the BNG metric 3.1 that was tested was the “Time to Target” (TTT) multiplier. This multiplier considered delaying or creating/enhancing a habitat in advance; this was tested to analyse how the multipliers affected the overall BU produced.

2.2 Habitat selection

After the pilot tests were done, habitats of restoration significance (Tables 1 and 2) were chosen to be input into the BNG 3.1 Metric. Intertidal habitats were handpicked after internal discussions as most relevant and most likely to be able to be restored (Table 1). The natural habitats all had high and very high distinctiveness whereas the artificial habitats had low distinctiveness. The terrestrial habitats were selected based upon their distinctiveness. Grassland and heathland & shrub were chosen following internal discussions, but it was decided that only habitats of high or very high distinctiveness should be tested in the BNG metric (Table 2).

Table 1: *Shows the intertidal habitats selected alongside their distinctiveness assigned to them in the metric.*

	Saltmarsh		*Seagrass*			*Biogenic reef*		
	Saltmarshes and saline reedbeds	*Artificial saltmarshes and saline reedbeds*	*Littoral seagrass*	*Littoral seagrass on peat, clay or chalk*	*Artificial littoral seagrass*	*Biogenic mussel reef*	*Biogenic sabellaria reef*	*Artificial biogenic reef*
Distinctiveness	High	Low	High	V. High	Low	High	High	Low
Multiplier	6	2	6	8	2	6	6	2

Table 2: *Displays the terrestrial habitats selected alongside their distinctiveness assigned to them in the metric.*

	Grassland							*Heathland and shrub*			
	Traditional orchids	*Flood wetland mosaic (CFGM)*	*Lowland calcareous grassland*	*Lowland dry acid grassland*	*Tall herb communities*	*Upland calcareous grassland*	*Upland hay meadows*	*Lowland heathland*	*Mountain heaths & willow scrub*	*Sea buckthorn scrub*	*Upland heathland*
Distinctiveness	High	High	High	V. High	High	High	V. High	High	V. High	High	High
Multiplier	6	6	6	8	6	6	8	6	8	6	6

2.3 Calculating the value of different habitats in the Biodiversity Net Gain metric

To maintain consistency the following attributes remained the same when each habitat was input into the metric:

- Area (ha): 1 ha.
- Habitat Baseline Condition: Fairly poor.
- Habitat Creation/Enhancement: Good.
- Strategic Significance: Area/compensation not in local strategy/ no local strategy (low strategic significance).
- Offsite Spatial Risk: Inside Landscape Protected Area (LPA) or Nature Conservation Area (NCA) for terrestrial and inside same marine plan area for intertidal

All habitats were tested on their onsite creation and enhancement. To calculate enhancement, the "area retained" feature of the metric was used. This referred to the baseline habitat that was retained and not impacted on. This area was then enhanced to contribute towards BU generation. Habitat creation was also input into the metric but in the opposite way. If 1ha of habitat was retained then 1 ha of habitat was therefore enhanced and no habitat was created. If 0 ha of habitat was retained then no habitat could be enhanced and 1 ha was instead created. For intertidal habitats, intervals of 0.2 ha transitioned between habitat creation and enhancement to analyse the units earned from each restoration method (Table 3). Terrestrial habitats followed this principle but instead was in intervals of 0.5 ha as it was deemed sufficient and showed the same overall pattern as intertidal habitats (Table 4).

Table 3: *Displays the transition from intertidal habitat enhancement to intertidal habitat creation in intervals of 0.2 ha.*

Area retained	Onsite enhancement	Onsite creation
1	1	0
0.8	0.8	0.2
0.6	0.6	0.4
0.4	0.4	0.6
0.2	0.2	0.8
0	0	1

Table 4: *Displays the transition from terrestrial habitat enhancement to terrestrial habitat creation in intervals of 0.5 ha.*

Area retained	Onsite enhancement	Onsite creation
1	1	0
0.5	0.5	0.5
0	0	1

3.0 Results:

Prior to selected habitat value calculations, tests were conducted on highlighted sections of the metric to understand how the metric functions and why negative multipliers are applied. Each test used littoral seagrass for both the baseline and enhanced habitat while using artificial littoral seagrass for the created habitat to maintain consistency. The other parameters were identical to the habitat tests apart from the specific function the test was targeting.

3.1 Spatial risk multiplier

A test was conducted to determine if there was a difference in restoring a habitat between onsite or offsite locations. As shown in Table 5, there is no difference between onsite and offsite units earned if the offsite compensation is inside the same marine plan area (or sufficiently local) to the site of biodiversity loss. If the compensation is in a neighbouring marine plan area then it has a negative multiplier of x0.75 and reduces the total units earned when compared to the onsite units. This decreases further if the compensation is deemed to be beyond a neighbouring marine plan area with a negative multiplier of x0.5. The spatial risk category is only found within the offsite creation and enhancement sections of the calculator.

Table 5: *Comparison of onsite creation and enhancement to offsite creation and enhancement units earned. The difference between onsite and offsite restoration is the inclusion of a spatial risk category. The habitat used in this example was littoral seagrass. See Tables 30 and 31 in Appendix B for full table breakdown.*

		Offsite Total Units Earned		
Baseline Habitat Retained (ha)	**Onsite Total Units Earned**	*Compensation inside same Marine Plan Area, or deemed to be sufficiently local, to site of biodiversity loss*	*Compensation outside same Marine Plan Area but in neighbouring Marine Plan Area*	*Compensation outside Marine Plan Area of impact site and beyond neighbouring Marine Plan Area*
1	20.04	20.04	17.53	15.03
0.8	16.43	16.43	14.38	12.33
0.6	12.82	12.82	11.22	9.62
0.4	9.21	9.21	8.06	6.92
0.2	5.6	5.6	4.91	4.21
0	1.99	1.99	1.75	1.51

3.2 Time to target condition multiplier

Both creation and enhancement of the habitat display similar trends when they are restored in advance or are delayed. The main difference is when the time to target condition hits zero the units delivered becomes 18 in both Table 6 and 7. When the habitat is delayed and the time to target condition exceeds 30 years (30+ years) then the units stop decreasing (Table 6).

Table 6: *Comparison of delaying or restoring in advance. This example uses onsite habitat enhancement to display the function of the multiplier. The habitat used in this example was littoral seagrass.*

Enhanced habitat units with no delay/advance	**Habitat enhanced in advance**			**Habitat enhancement delayed**		
	Number of years prior to development	*Time to target condition*	*Enhanced Habitat units delivered*	*Number of years after development*	*Time to target condition*	*Enhanced habitat units delivered*
10.02	5	25	10.22	5	30+	9.95
	10	20	10.46	10	30+	9.95
	15	15	10.74	15	30+	9.95
	20	10	11.08	20	30+	9.95
	25	5	11.49	25	30+	9.95
	27	3	11.67	27	30+	9.95
	29	1	11.87	29	30+	9.95
	30	0	18	30	30+	9.95

Table 7: *Comparison of delaying or restoring in advance. This example uses onsite habitat creation to display the function of the multiplier.*

Created habitat units with no delay/advance	**Habitat created in advance**			**Habitat created delayed**		
	Number of years prior to development	*Time to target condition*	*Created Habitat units delivered*	*Number of years after development*	*Time to target condition*	*Created habitat units delivered*
2.91	5	15	3.48	2	22	2.71
	10	10	4.16	4	24	2.53
	15	5	4.97	6	26	2.35
	17	3	5.34	8	28	2.19
	19	1	5.73	10	30	2.04
	20	0	18	11	30+	1.9

3.3 Saltmarsh habitats:

This analysis focused on the difference between onsite creation and onsite enhancement of both “saltmarshes and saline reedbeds” and “artificial saltmarshes and saline reedbeds”.

As shown in Table 8, natural saltmarsh earned 24.35 BU when 1 ha of the onsite baseline was retained and entirely enhanced from “fairly poor” to “good” condition (see Table 27 in Appendix A for more detail). This had a value of £243,500 if one BU is equal to £10,000. When compared to 1 ha of creation and no habitat retained (therefore no habitat enhanced), there is a significant difference. When 1 ha of artificial saltmarsh was created it generated 4.34 BU which could equate to £43,400 if a BU is equal to £10,000. The difference between enhancement and creation of saltmarsh habitats is £200,100 worth of credits (if valued at £10,000/BU).

Table 9 displays the habitat baseline of artificial saltmarsh. Artificial saltmarsh, when 1ha is enhanced, earned 8.12 BU; this equates to £81,200. In comparison, when the baseline habitat is not retained and 1ha of artificial saltmarsh is created it has a value of 2.22 BU or £22,200. The difference between enhancement and creation for this habitat is £59,000.

Table 8: *Baseline habitat was saltmarshes and saline reedbeds. As the baseline habitat retained decreases, the area of natural saltmarsh enhanced decreases and the area of artificial saltmarsh created increases. See Table 27, Appendix A for full table breakdown.*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	24.35	270.57%	£219,150.00	£243,500.00	£292,200.00
0.8	20.35	226.09%	£183,150.00	£203,500.00	£244,200.00
0.6	16.34	181.61%	£147,060.00	£163,400.00	£196,080.00
0.4	12.34	137.13%	£111,060.00	£123,400.00	£148,080.00
0.2	8.34	92.65%	£75,060.00	£83,400.00	£100,080.00
0	4.34	48.18%	£39,060.00	£43,400.00	£52,080.00

Table 9: *Baseline habitat was artificial saltmarshes and saline reedbeds. Table shows the change in units earned as habitat enhancement decreases and habitat creation increases (see Table 28, Appendix A for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	8.12	270.57%	£73,080.00	£81,200.00	£97,440.00
0.8	6.94	231.24%	£62,460.00	£69,400.00	£83,280.00
0.6	5.76	191.92%	£51,840.00	£57,600.00	£69,120.00
0.4	4.58	152.60%	£41,220.00	£45,800.00	£54,960.00
0.2	3.4	113.28%	£30,600.00	£34,000.00	£40,800.00
0	2.22	73.96%	£19,980.00	£22,200.00	£26,640.00

3.4 Littoral seagrass habitats:

This test focused on littoral seagrass habitats with artificial seagrass habitat being used for all onsite creation within the metric (see Appendix B for more detail).

Of the three habitats, littoral seagrass had the highest value with 20.04 BU or £200,400 worth of credits (Table 10). Littoral seagrass on peat, clay or chalk earned a maximum of 5.96 BU (£59,600) and artificial littoral seagrass earned 6.68 BU (£66,800) (Tables 11 and 12). Table 11 displays how the loss of littoral seagrass on peat, clay or chalk was unacceptable. The calculator did not produce a final BU value due to this. Unlike the other two habitats (Tables 10 and 11), littoral seagrass on peat, clay or chalk decreased in BU as habitat retained decreased but the percentage “Net Gain” increased (Table 12).

Table 10: *Baseline habitat was littoral seagrass. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 29, Appendix B for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	20.04	222.67%	£180,360.00	£200,400.00	£240,480.00
0.8	16.43	182.56%	£147,870.00	£164,300.00	£197,160.00
0.6	12.82	142.45%	£115,380.00	£128,200.00	£153,840.00
0.4	9.21	102.34%	£82,890.00	£92,100.00	£110,520.00
0.2	5.6	62.23%	£50,400.00	£56,000.00	£67,200.00
0	1.99	22.12%	£17,910.00	£19,900.00	£23,880.00

Table 11: *Baseline habitat was littoral seagrass on peat, clay or chalk. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 32, Appendix B for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	5.96	24.82%	£53,640.00	£59,600.00	£71,520.00
0.8	5.55	28.93%	£49,950.00	£55,500.00	£66,600.00
0.6	5.15	35.79%	£46,350.00	£51,500.00	£61,800.00
0.4	UNACCEPTABLE LOSS		N/A	N/A	N/A
0.2	UNACCEPTABLE LOSS		N/A	N/A	N/A
0	UNACCEPTABLE LOSS		N/A	N/A	N/A

Table 12: *Baseline habitat was artificial littoral seagrass. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 33, Appendix B for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	6.68	222.67%	£60,120.00	£66,800.00	£80,160.00
0.8	5.61	186.87%	£50,490.00	£56,100.00	£67,320.00
0.6	4.53	151.08%	£40,770.00	£45,300.00	£54,360.00
0.4	3.46	115.29%	£31,140.00	£34,600.00	£41,520.00
0.2	2.38	79.49%	£21,420.00	£23,800.00	£28,560.00
0	1.31	43.70%	£11,790.00	£13,100.00	£15,720.00

3.5 Biogenic reef habitats:

Analysis focused on the difference between onsite creation and onsite enhancement of biogenic mussel reefs, biogenic sabellaria reefs and artificial biogenic reefs. The format of previous habitat tests was followed for this analysis.

As shown in Tables 13 and 14, the creation and enhancement of both sabellaria reef and mussel reef resulted in the same total units earned. The BNG calculator deemed them to be of equal biodiversity value and both produced a maximum of 27.07 BU or £270,700 worth of credits. Artificial biogenic reef produced 9.02 BU or £90,200 which is £180,500 less than biogenic mussel and sabellaria reef (Appendix C for more detail).

Table 13: *Baseline habitat was biogenic mussel reef. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 34, Appendix C for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	27.07	300.77%	£243,630.00	£270,700.00	£324,840.00
0.8	22.79	253.27%	£205,110.00	£227,900.00	£273,480.00
0.6	18.52	205.77%	£166,680.00	£185,200.00	£222,240.00
0.4	14.24	158.27%	£128,160.00	£142,400.00	£170,880.00
0.2	9.97	110.77%	£89,730.00	£99,700.00	£119,640.00
0	5.69	63.28%	£51,210.00	£56,900.00	£68,280.00

Table 14: *Baseline habitat was biogenic sabellaria reef. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 35, Appendix C for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	27.07	300.77%	£243,630.00	£270,700.00	£324,840.00
0.8	22.79	253.27%	£205,110.00	£227,900.00	£273,480.00
0.6	18.52	205.77%	£166,680.00	£185,200.00	£222,240.00
0.4	14.24	158.27%	£128,160.00	£142,400.00	£170,880.00
0.2	9.97	110.77%	£89,730.00	£99,700.00	£119,640.00
0	5.69	63.28%	£51,210.00	£56,900.00	£68,280.00

Table 15: *Baseline habitat was artificial biogenic reef. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 36, Appendix C for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	9.02	300.77%	£81,180.00	£90,200.00	£108,240.00
0.8	7.75	258.43%	£69,750.00	£77,500.00	£93,000.00
0.6	6.48	216.09%	£58,320.00	£64,800.00	£77,760.00
0.4	5.21	173.74%	£46,890.00	£52,100.00	£62,520.00
0.2	3.94	131.40%	£35,460.00	£39,400.00	£47,280.00
0	2.67	89.06%	£24,030.00	£26,700.00	£32,040.00

3.6 Grassland habitats:

Unlike the intertidal habitats, the terrestrial baseline habitat retained decreased in intervals of 0.5ha, as explained in section 2.3. Although not as detailed as the intertidal trials, the decreasing area retained still displays the pattern of the previous tests.

Other than lowland dry acid grassland and upland hay meadows (Tables 19 and 22), grassland habitats earned over 20 BU when 1ha was retained and enhanced. Flood wetland mosaic (CFGM) (Table 17) earned the highest total units with 27.4 BU or £274,000. Both the lowland dry acid grassland and upland hay meadows were “very high distinctiveness” habitats (Table 2) and did not produce BU when under 0.5ha of habitat was retained as the calculator deemed the loss to be unacceptable (Tables 19 and 22).

Table 16: *Baseline habitat was traditional orchids. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 37, Appendix D for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	23.91	265.71%	£215,190.00	£239,100.00	£286,920.00
0.5	16.53	183.63%	£148,770.00	£165,300.00	£198,360.00
0	9.14	101.54%	£82,260.00	£91,400.00	£109,680.00

Table 17: *Baseline habitat was flood wetland mosaic (CFGM). Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 38, Appendix D for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	27.4	304.42%	£246,600.00	£274,000.00	£328,800.00
0.5	17.51	194.50%	£157,590.00	£175,100.00	£210,120.00
0	7.61	84.58%	£68,490.00	£76,100.00	£91,320.00

Table 18: *Baseline habitat was lowland calcareous grassland. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 39, Appendix D for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	21.48	238.68%	£193,320.00	£214,800.00	£257,760.00
0.5	13.07	145.19%	£117,630.00	£130,700.00	£156,840.00
0	4.65	51.70%	£41,850.00	£46,500.00	£55,800.00

Table 19: *Baseline habitat was lowland dry acid grassland. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 40, Appendix D for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	3.25	13.54%	£29,250.00	£32,500.00	£39,000.00
0.5	3.7	30.87%	£33,300.00	£37,000.00	£44,400.00
0	UNACCEPTABLE LOSS		N/A	N/A	N/A

Table 20: *Baseline habitat was tall herb communities. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 41, Appendix D for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	21.48	238.68%	£193,320.00	£214,800.00	£257,760.00
0.5	12.63	140.34%	£113,670.00	£126,300.00	£151,560.00
0	3.78	42.00%	£34,020.00	£37,800.00	£45,360.00

Table 21: *Baseline habitat was upland calcareous grassland. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 42, Appendix D for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	21.13	234.76%	£190,170.00	£211,300.00	£253,560.00
0.5	12.56	139.61%	£113,040.00	£125,600.00	£150,720.00
0	4	44.46%	£36,000.00	£40,000.00	£48,000.00

Table 22: *Baseline habitat was upland hay meadows. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 43, Appendix D for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	8.47	35.28%	£76,230.00	£84,700.00	£101,640.00
0.5	8.29	69.11%	£74,610.00	£82,900.00	£99,480.00
0	UNACCEPTABLE LOSS		N/A	N/A	N/A

3.7 Heathland habitats:

The format of these tests was the same as section 3.6, the baseline habitat retained decreased in intervals of 0.5ha. Other than mountain heaths and willow shrubs (Table 24), the three other habitats earned high amounts of BU. Sea buckthorn scrub earned 30.61 BU or £306,100.00 when 1 ha of the baseline habitat was retained and enhanced. Mountain heaths and willow shrubs was a "very high distinctiveness" habitat (Table 2) and when habitat retained was less than 0.5ha the calculator deemed the loss to be unacceptable (Table 24).

Table 23: *Baseline habitat was lowland heathland. Table shows the units earned as habitat enhancement decreases and habitatbcreation increases (see Table 44, Appendix E for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	23.91	265.71%	£215,190.00	£239,100.00	£286,920.00
0.5	14.39	170.79%	£129,510.00	£143,900.00	£172,680.00
0	4.86	53.96%	£43,740.00	£48,600.00	£58,320.00

Table 24: *Baseline habitat was mountain heaths and willow shrubs. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 45, Appendix E for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	2.53	10.55%	£22,770.00	£25,300.00	£30,360.00
0.5	3.17	26.38%	£28,530.00	£31,700.00	£38,040.00
0	UNACCEPTABLE LOSS		N/A	N/A	N/A

Table 25: *Baseline habitat was sea buckthorn scrub. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 46, Appendix E for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	30.61	340.06%	£275,490.00	£306,100.00	£367,320.00
0.5	22.68	251.96%	£204,120.00	£226,800.00	£272,160.00
0	14.75	163.87%	£132,750.00	£147,500.00	£177,000.00

Table 26: *Baseline habitat was upland heathland. Table shows the units earned as habitat enhancement decreases and habitat creation increases (see Table 47, Appendix E for full table breakdown).*

Baseline Habitat Retained (ha)	Total Units Earned	% Net Gain	Biodiversity Credit Value		
			£9000.00	***£10000.00***	***£12000.00***
1	22.14	246.02%	£199,260.00	£221,400.00	£265,680.00
0.5	14.18	157.52%	£127,620.00	£141,800.00	£170,160.00
0	6.21	69.03%	£55,890.00	£62,100.00	£74,520.00

4.0 Discussion

4.1 Spatial risk multipliers

Testing of the metric displays that the difference between onsite and offsite creation or enhancement is the location of the offsite restoration relative to the onsite location. Both intertidal and terrestrial have a spatial risk category that acts as an incentive to keep the restoration local to the onsite location. Both have three categories that have the same multipliers but how they are determined as local differs (Section 2.1).

Table 5 shows that this multiplier incentivises the developer to keep the restoration local to where the impact occurs. If it is within the same Marine Plan Area or LPA/NCA then the end output of BU remains the same as onsite restoration. This provides a degree of flexibility to the developer when choosing where to restore. If the restoration is done further away from the baseline site, the overall BU earned can be halved.

4.2 Time to Target Condition

Restoring a habitat in advance or delaying it did not seem to impact the total BU earned as significantly as the spatial risk multiplier. Table 7 shows that if a habitat is delayed and the time to target condition is 30+ years, the BU earned is only 0.07 BU less than if there was no delay. For Table 8, this gap increases to 0.81 BU but does not seem significant when compared to the spatial risk multiplier. On the other hand, when the time to target condition is decreased to 0 years, the BU earned becomes 18 BU for both creation and enhancement (Tables 6 and 7). This is a significant increase and is an incentive for developers to have established habitats that are restored to the required condition prior to a development. This ties into the use of habitat banks, by having areas of habitat that have been created or enhanced a number of years before development then the worth of that habitat will increase each year until the time to target condition reaches 0 years.

4.3 Intertidal habitats v. terrestrial habitats

For the intertidal habitats, the enhancement of natural biogenic reefs, sabellaria and mussel, produced the highest amount of BU with 27.07 BU or £270,700.00. For the terrestrial habitats, sea buckthorn scrub enhancement earned 30.61 BU or £306,100.00. The creation of habitats on terrestrial habitats were overall higher than intertidal habitats. This was due to the intertidal habitat creation being associated with artificial habitats of which had a lower distinctiveness than their natural counterpart. The metric does not have artificial versions of the habitats found within grassland or heathland habitats.

4.4 Habitat distinctiveness

Artificial habitats, be that artificial seagrass (6.68 BU), produce less BU than that of a natural habitat, like littoral seagrass (20.04 BU) (Tables 10 and 12). This is mainly determined by the distinctiveness value that is associated with artificial habitats (Table 2). Artificial habitats have a “low distinctiveness” and therefore produce less units than a habitat of high distinctiveness. What determines an intertidal habitat to be artificial is not made evident. If the creation of a habitat makes it artificial it would mean that enhancing a habitat that is already found in the area to be much more favourable for developers. In the majority of the

results, enhancement of the habitat resulted in higher BU's earned. This would be due to the risk of enhancing an already established habitat being lower than creating a habitat from nothing.

When a habitat of "very high distinctiveness" is input into the metric and the area is not retained past 0.5 ha then it becomes unacceptable loss and bespoke compensation is required, this is shown in Tables 11, 19, 22 and 24. The "very high distinctiveness" habitats displayed a trend that when the area retained decreased the percentage net gain increased. For Tables 11 and 22, their net gain increased even though the BU earned decreased. Tables 19 and 24 BU increased alongside their net gain. This did not follow the same pattern as the other habitats tested in this report.

In order to produce a high amount of BU, the developer must consider the distinctiveness of a habitat. If it is too low, "low distinctiveness", then the return will be poor but if it is too high, "very high distinctiveness", then in some cases BU will not be earned. By restoring "high distinctiveness" habitats the developer can produce more BU without the risk of unacceptable loss.

4.5 Feasibility of a BCM in the UK

Although this study assumed a credits worth to be within £9000-£12000 this will most likely change if a BCM is implemented in the UK. A study by Alvarado-Quesada et al. (2013) researched around BCMs and highlighted five case studies. All of the banks studied, both regulatory and voluntary habitat banks, had a large range in the price per unit. As BNG highlights a range of habitats, both terrestrial and intertidal, the worth of a single unit may not be a set figure. Another issue is that each BCM or banking scheme has a different methodology that is used to determine the unit value of biodiversity. The BNG metric is unique and the units produced is not intended to value the habitat in a monetary sense. The BU does give the habitat a worth that needs to be offset to achieve a net gain but other considerations may need to be considered to assess its value.

The main credit market in the US is the US Wetland and Species Conservation Banks (WSCBs). Compensation is referred to as a "credit" and habitat lost is a "debit" (Alvarado-Quesada et al. 2013; Briggs, Hill and Gillespie, 2009). These banks are centred around wetland habitats which means credits can be easily compared and weighted by either condition or size. If the UK is to build a market around the BNG metric, this would be much more complicated as different habitats would have different values due to their distinctiveness. However, the BNG metric does display evidence that habitat banks could be implemented. As shown in section 3.0, creating or enhancing a habitat ("credit") in advance to the habitat loss ("debit") can boost the BU value, especially if the time to target condition is 0 years. The use of habitat banks can store "credits" in advance of "debits" (Briggs, Hill and Gillespie, 2009) and therefore can increase in value as their time to target decreases and eventually reaches zero years.

The UK Government has mentioned a market-based approach in the recent Marine Net Gain (MNG) consultation that was released by Defra (Department for Environment, Food and

Rural Affairs, 2022a). This consultation states “The Government is encouraging a market-based approach to delivering off-site habitat for terrestrial biodiversity net gain, whereby third parties will be able to create and sell BU to developers who need them” but this centralised trading platform for biodiversity credits will most likely be created by the private sector and, like other biodiversity credit markets around the world, will have ranges in credit value due to prices agreed between buyers and sellers (Department for Environment, Food and Rural Affairs, 2022a; Ecology by Design, 2021).

The creation of habitat bank networks has already begun in the UK (Jacobs et al., 2013, pp.325–329). The Environment Bank LTD have recently started integrating BNG delivery into their projects. They aim to create a network of habitat banks with at least one in each LPA to ensure strategic placement (Environment Bank, 2022). This is aimed to allow developers to buy BNG units to ensure they are achieving a 10% net gain to the environment. The use of BNG may be an advantage to a BCM within the UK due to the calculations that value a habitat. Places in Europe, like Spain, have experienced challenges with a BCM due to a lack of ecological metrics that can quantify offsets without being subjective (Maestre-Andrés et al., 2020). The BNG metric, although somewhat subjective for multipliers like condition, attempts to calculate quantitative data on a developments impact on biodiversity and the amount of biodiversity created from restoration.

5.0 Conclusions

The use of a BNG metric to produce biodiversity credits displayed how certain habitats and methods of restoration could benefit the developer more than others. By avoiding impacts on “very high distinctiveness” habitats the developer will not need to consider bespoke compensation. Furthermore, by enhancing the baseline habitat the BU earned is higher than if a habitat is created. This is due to a lower risk being associated with this method of restoration. For intertidal habitats, enhancing a natural habitat will produce a high amount of BU; creating artificial habitats does not return a high amount of BU and therefore would not be a good option for habitat banking. If a habitat can be created in advance, by the time a development is consented the time to target condition is 0 years, the unit value increases drastically. This could be utilised by creating or enhancing habitats in advance to be used as habitat banks for future projects or selling BU to other developers. This is seen in other habitat banking schemes around the world, a good example being the US WSCBs that use credits and debits when buying and selling. Unlike most BCM found globally, a UK based BCM would most likely use the BNG metric to calculate the value of the habitat lost, created or enhanced. Due to the wide range of habitats listed within this metric, from intertidal to terrestrial, there may be more complications on the worth of certain credits and using credits from intertidal habitats on debits from terrestrial habitats. Questions on if the habitat credits will be specific to that habitat restored and can only be used on the same habitat that has been lost (like-for-like).

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7.0 Appendices

7.1 Appendix A: Saltmarsh and saline reedbed habitats

Table 27: *Saltmarsh calculations of the BNG metric. Onsite creation of artificial saltmarsh had a TTT of 15 years. Onsite and offsite enhancement of saltmarsh had a TTT of 18 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement					Total Units Earned
Area (ha)	Condition	Strategic significance	Units Worth	Area retained (ha)	Habitat Type	Area (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area (ha)	Condition	Strategic significance	Units Worth	Area retained (ha)	Area enhanced (ha)	Condition	Strategic significance	Spatial risk category	Habitat Units Delivered	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Saltmarshes and saline reedbeds	1	Good	Low	12.18	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	1	1	Good	Low	Same Marine Plan Area	12.18	**24.35**
1	Fairly poor	Low	9	0.8	Artificial saltmarshes and saline reed beds	0.2	Good	Low	0.23	Saltmarshes and saline reedbeds	0.8	Good	Low	9.74	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	1	1	Good	Low	Same Marine Plan Area	12.18	**20.35**
1	Fairly poor	Low	9	0.6	Artificial saltmarshes and saline reed beds	0.4	Good	Low	0.46	Saltmarshes and saline reedbeds	0.6	Good	Low	7.31	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	1	1	Good	Low	Same Marine Plan Area	12.18	**16.34**

1	Fairly poor	Low	9	0.4	Artificial saltmarshes and saline reed beds	0.6	Good	Low	0.7	Saltmarshes and saline reedbeds	0.4	Good	Low	4.87	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	1	1	Good	Low	Same Marine Plan Area	12.18	**12.34**
1	Fairly poor	Low	9	0.2	Artificial saltmarshes and saline reed beds	0.8	Good	Low	0.93	Saltmarshes and saline reedbeds	0.2	Good	Low	2.44	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	1	1	Good	Low	Same Marine Plan Area	12.18	**8.34**
1	Fairly poor	Low	9	0	Artificial saltmarshes and saline reed beds	1	Good	Low	1.16	N/A	N/A	N/A	N/A	N/A	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	1	1	Good	Low	Same Marine Plan Area	12.18	**4.34**

Table 28: *Artificial saltmarsh calculations of the BNG metric. This focused on the offsite creation and enhancement so A2 and A3 of the metric were not used. TTT for offsite creation was 15 years and for offsite enhancement was 18 years.*

A1- Onsite Habitat Baseline					**D-1 Offsite Habitat Baseline**						**D-2 Offsite Habitat Creation**						**D-3 Offsite Habitat Enhancement**						**Total Units Earned**
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic Significance**	**Spatial risk**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	
1	Fairly poor	Low	3	0	Artificial saltmarshes and saline reedbeds	1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	N/A	Saltmarshes and saline reedbeds	1	Good	Low	Same Marine Plan Area	12.18	**9.18**

1	Fairly poor	Low	3	0	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	0.8	Artificial saltmarshes and saline reedbeds	0.2	Good	Low	Same Marine Plan Area	0.23	Saltmarshes and saline reedbeds	0.8	Good	Low	Same Marine Plan Area	9.74	**5.17**
1	Fairly poor	Low	3	0	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	0.6	Artificial saltmarshes and saline reedbeds	0.4	Good	Low	Same Marine Plan Area	0.46	Saltmarshes and saline reedbeds	0.6	Good	Low	Same Marine Plan Area	7.31	**1.17**
1	Fairly poor	Low	3	0	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	0.4	Artificial saltmarshes and saline reedbeds	0.6	Good	Low	Same Marine Plan Area	0.7	Saltmarshes and saline reedbeds	0.4	Good	Low	Same Marine Plan Area	4.87	**-2.83**
1	Fairly poor	Low	3	0	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	0.2	Artificial saltmarshes and saline reedbeds	0.8	Good	Low	Same Marine Plan Area	0.93	Saltmarshes and saline reedbeds	0.2	Good	Low	Same Marine Plan Area	2.44	**-6.84**
1	Fairly poor	Low	3	0	Saltmarshes and saline reedbeds	1	Fairly poor	Low	9	0	Artificial saltmarshes and saline reedbeds	1	Good	Low	Same Marine Plan Area	1.16	N/A	N/A	N/A	N/A	N/A	N/A	**-10.84**

7.2 Appendix B: Littoral seagrass habitats

Table 29: *Littoral seagrass calculations of the BNG metric. This focused on the onsite creation and enhancement so offsite enhancement was consistent throughout. Onsite creation TTT is 20 years. Onsite and offsite enhancement TTT is 30 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	Condition	Strategic significance	Units Worth	Area retained	Habitat Type	Area (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Spatial risk category	Habitat Units Delivered	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	Same Marine Plan Area	10.02	**20.04**
1	Fairly poor	Low	9	0.8	Artificial littoral seagrass	0.2	Good	Low	0.19	Littoral seagrass	0.8	Good	Low	8.02	Littoral seagrass	1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	Same Marine Plan Area	10.02	**16.43**
1	Fairly poor	Low	9	0.6	Artificial littoral seagrass	0.4	Good	Low	0.39	Littoral seagrass	0.6	Good	Low	6.01	Littoral seagrass	1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	Same Marine Plan Area	10.02	**12.82**
1	Fairly poor	Low	9	0.4	Artificial littoral sea	0.6	Good	Low	0.58	Littoral seagrass	0.4	Good	Low	4.01	Littoral seagrass	1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	Same Marine Plan	10.02	**9.21**

					grass																		Area		
1	Fairly poor	Low	9	0.2	Artificial littoral seagrass	0.8	Good	Low	0.78	Littoral seagrass	0.2	Good	Low	2	Littoral seagrass	1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	Same Marine Plan Area	10.02	**5.6**
1	Fairly poor	Low	9	0	Artificial littoral seagrass	1	Good	Low	0.97	N/A	N/A	N/A	N/A	N/A	Littoral seagrass	1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	Same Marine Plan Area	10.02	**1.99**

Table 30: *Littoral seagrass calculations of the BNG metric. This focused on the offsite creation and enhancement to notice if there were differences between onsite (Table 29) and offsite restoration. Offsite creation TTT is 20 years. Onsite and offsite enhancement TTT is 30 years.*

A1- Onsite Habitat Baseline					**A3- Onsite Habitat Enhancement**					**D-1 Offsite Habitat Baseline**						**D-2 Offsite Habitat Creation**						**D-3 Offsite Habitat Enhancement**						
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic Significance**	**Spatial risk**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	**Total Units Earned**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	N/A	Littoral seagrass	1	Good	Low	Same Marine Plan Area	10.02	**20.04**

1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0.8	Artificial littoral seagrass	0.2	Good	Low	Same Marine Plan Area	0.19	Littoral seagrass	0.8	Good	Low	Same Marine Plan Area	8.02	**16.43**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0.6	Artificial littoral seagrass	0.4	Good	Low	Same Marine Plan Area	0.39	Littoral seagrass	0.6	Good	Low	Same Marine Plan Area	6.01	**12.82**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0.4	Artificial littoral seagrass	0.6	Good	Low	Same Marine Plan Area	0.58	Littoral seagrass	0.4	Good	Low	Same Marine Plan Area	4.01	**9.21**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0.2	Artificial littoral seagrass	0.8	Good	Low	Same Marine Plan Area	0.78	Littoral seagrass	0.2	Good	Low	Same Marine Plan Area	2	**5.6**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0	Artificial littoral sea	1	Good	Low	Same Marine Plan		N/A	N/A	N/A	N/A	N/A	N/A	**1.99**

																	gra ss				Ar ea									

Table 31: *Littoral seagrass calculations of the BNG metric. This focused on the offsite spatial risk category to note the change in units earned if restoration was done further away (compared to Table 30). Offsite creation TTT is 20 years. Onsite and offsite enhancement TTT is 30 years. Having the offsite area in a neighbouring marine plan area decreases the total units generated. The multipliers go: Same Marine Plan Area x1; In Neighbouring Marine Plan Area x0.75; Beyond Neighbouring Marine Plan Area x0.5.*

A1- Onsite Habitat Baseline					**A3- Onsite Habitat Enhancement**					**D-1 Offsite Habitat Baseline**					**D-2 Offsite Habitat Creation**						**D-3 Offsite Habitat Enhancement**							
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic Significance**	**Spatial risk**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	**Total Units Earned**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	N/A	Littoral seagrass	1	Good	Low	In Neighbouring Marine Plan Area	7.51	**17.53**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0.8	Artificial littoral seagrass	0.2	Good	Low	In Neighbouring Marine Plan Area	0.15	Littoral seagrass	0.8	Good	Low	In Neighbouring Marine Plan Area	6.01	**14.38**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0.6	Artificial littoral sea	0.4	Good	Low	In Neighbouring Marine Plan Area	0.29	Littoral seagrass	0.6	Good	Low	In Neighbouring Marine Plan Area	4.51	**11.22**

																grass										
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0.4	Artificial littoral seagrass	0.6	Good	Low	In Neighbouring Marine Plan Area	0.44	Littoral seagrass	0.4	Good	Low	In Neighbouring Marine Plan Area	3.01	**8.06**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0.2	Artificial littoral seagrass	0.8	Good	Low	In Neighbouring Marine Plan Area	0.58	Littoral seagrass	0.2	Good	Low	In Neighbouring Marine Plan Area	1.5	**4.91**
1	Fairly poor	Low	9	1	Littoral seagrass	1	Good	Low	10.02	Littoral seagrass	1	Fairly poor	Low	9	0	Artificial littoral seagrass	1	Good	Low	In Neighbouring Marine Plan Area	0.73	N/A	N/A	N/A	N/A	N/A	N/A	**1.75**

Table 32: *Littoral seagrass on peat, clay or chalk calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 20 years. Onsite and offsite enhancement TTT is 8 years. Due to high distinctiveness habitat, any loss is unacceptable and the calculator does not provide an output after area retained is below 0.5.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	**Total Units Earned**
1	Fairly poor	Low	12	1	N/A	N/A	N/A	N/A	N/A	Littoral seagrass on peat, clay or chalk	1	Good	Low	14.98	Littoral seagrass on peat, clay or chalk	1	Fairly poor	Low	12	1	e	1	Good	Low	Same Marine Plan Area	14.98	**5.96**
1	Fairly poor	Low	12	0.8	Artificial littoral seagrass	0.2	Good	Low	0.19	Littoral seagrass on peat, clay or chalk	0.8	Good	Low	11.98	Littoral seagrass on peat, clay or chalk	1	Fairly poor	Low	12	1	Littoral seagrass on peat, clay or chalk	1	Good	Low	Same Marine Plan Area	14.98	**5.55**

1	Fairly poor	Low	12	0.6	Artificial littoral seagrass	0.4	Good	Low	0.39	Littoral seagrass on peat, clay or chalk	0.6	Good	Low	8.99	Littoral seagrass on peat, clay or chalk	1	Fairly poor	Low	12	1	Littoral seagrass on peat, clay or chalk	1	Good	Low	Same Marine Plan Area	14.98	**5.15**
1	Fairly poor	Low	12	0.4	Artificial littoral seagrass	0.6	Good	Low	0.58	Littoral seagrass on peat, clay or chalk	0.4	Good	Low	UNNACCEPTABLE LOSS	Littoral seagrass on peat, clay or chalk	1	Fairly poor	Low	12	1	Littoral seagrass on peat, clay or chalk	1	Good	Low	Same Marine Plan Area	14.98	**UNACCEPTABLE LOSS**
1	Fairly poor	Low	12	0.2	Artificial littoral seagrass	0.8	Good	Low	0.78	Littoral seagrass on peat, clay or chalk	0.2	Good	Low	UNNACCEPTABLE LOSS	Littoral seagrass on peat, clay or chalk	1	Fairly poor	Low	12	1	Littoral seagrass on peat, clay or chalk	1	Good	Low	Same Marine Plan Area	14.98	**UNACCEPTABLE LOSS**

1	Fairly poor	Low	12	0	Artificial littoral seagrass	1	Good	Low	0.97	N/A	N/A	N/A	N/A	N/A	Littoral seagrass on peat, clay or chalk	1	Fairly poor	Low	12	1	Littoral seagrass on peat, clay or chalk	1	Good	Low	Same Marine Plan Area	14.98	**UNACCEPTABLE LOSS**

Table 33: *Artificial littoral seagrass calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 20 years. Onsite and offsite enhancement TTT is 30 years. Artificial habitat creation seems to produce lower habitat units than natural enhancement.*

A1- Onsite Habitat Baseline					**A2- Onsite Habitat Creation**					**A3- Onsite Habitat Enhancement**					**D-1 Offsite Habitat Baseline**						**D-3 Offsite Habitat Enhancement**						
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	**Total Units Earned**
1	Fairly poor	Low	3	1	N/A	N/A	N/A	N/A	N/A	Artificial littoral seagrass	1	Good	Low	3.34	Artificial littoral seagrass	1	Fairly poor	Low	3	1	Artificial littoral seagrass	1	Good	Low	Same Marine Plan Area	3.34	**6.68**
1	Fairly poor	Low	3	0.8	Artificial littoral sea	0.2	Good	Low	0.19	Artificial littoral sea	0.8	Good	Low	2.67	Artificial littoral sea	1	Fairly poor	Low	3	1	Artificial littoral sea	1	Good	Low	Same Marine Plan	3.34	**5.61**

					grass					grass					grass						grass				Area		
1	Fairly poor	Low	3	0.6	Artificial littoral seagrass	0.4	Good	Low	0.39	Artificial littoral seagrass	0.6	Good	Low	2	Artificial littoral seagrass	1	Fairly poor	Low	3	1	Artificial littoral seagrass	1	Good	Low	Same Marine Plan Area	3.34	**4.53**
1	Fairly poor	Low	3	0.4	Artificial littoral seagrass	0.6	Good	Low	0.58	Artificial littoral seagrass	0.4	Good	Low	1.34	Artificial littoral seagrass	1	Fairly poor	Low	3	1	Artificial littoral seagrass	1	Good	Low	Same Marine Plan Area	3.34	**3.46**
1	Fairly poor	Low	3	0.2	Artificial littoral seagrass	0.8	Good	Low	0.78	Artificial littoral seagrass	0.2	Good	Low	0.67	Artificial littoral seagrass	1	Fairly poor	Low	3	1	Artificial littoral seagrass	1	Good	Low	Same Marine Plan Area	3.34	**2.38**
1	Fairly poor	Low	3	0	Artificial littoral seagrass	1	Good	Low	0.97	N/A	N/A	N/A	N/A	N/A	Artificial littoral seagrass	1	Fairly poor	Low	3	1	Artificial littoral seagrass	1	Good	Low	Same Marine Plan Area	3.34	**1.31**

7.3 Appendix C: Biogenic Reef Habitats

Table 34: *Littoral mussel reef calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 15 years, onsite and offsite enhancement TTT is 8 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Spatial risk category	Habitat Units Delivered	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Littoral biogenic reefs - Mussels	1	Good	Low	13.53	Littoral biogenic reefs - Mussels	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Mussels	1	Good	Low	Same Marine Plan Area	13.53	**27.07**
1	Fairly poor	Low	9	0.8	Artificial littoral biogenic reefs	0.2	Good	Low	0.23	Littoral biogenic reefs - Mussels	0.8	Good	Low	10.83	Littoral biogenic reefs - Mussels	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Mussels	1	Good	Low	Same Marine Plan Area	13.53	**22.79**
1	Fairly poor	Low	9	0.6	Artificial littoral biogenic reefs	0.4	Good	Low	0.46	Littoral biogenic reefs - Mussels	0.6	Good	Low	8.12	Littoral biogenic reefs - Mussels	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Mussels	1	Good	Low	Same Marine Plan Area	13.53	**18.52**

1	Fairly poor	Low	9	0.4	Artificial littoral biogenic reefs	0.6	Good	Low	0.7	Littoral biogenic reefs - Mussels	0.4	Good	Low	5.41	Littoral biogenic reefs - Mussels	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Mussels	1	Good	Low	Same Marine Plan Area	13.53	**14.24**
1	Fairly poor	Low	9	0.2	Artificial littoral biogenic reefs	0.8	Good	Low	0.93	Littoral biogenic reefs - Mussels	0.2	Good	Low	2.71	Littoral biogenic reefs - Mussels	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Mussels	1	Good	Low	Same Marine Plan Area	13.53	**9.97**
1	Fairly poor	Low	9	0	Artificial littoral biogenic reefs	1	Good	Low	1.16	N/A	N/A	N/A	N/A	N/A	Littoral biogenic reefs - Mussels	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Mussels	1	Good	Low	Same Marine Plan Area	13.53	**5.69**

Table 35: *Littoral Sabellaria reef calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 15 years, offsite enhancement TTT is 8 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Spatial risk category	Habitat Units Delivered	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Littoral biogenic reefs - Sabellaria	1	Good	Low	13.53	Littoral biogenic reefs - Sabellaria	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Sabellaria	1	Good	Low	Same Marine Plan Area	13.53	**27.07**
1	Fairly poor	Low	9	0.8	Artificial littoral biogenic reefs	0.2	Good	Low	0.23	Littoral biogenic reefs - Sabellaria	0.8	Good	Low	10.83	Littoral biogenic reefs - Sabellaria	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Sabellaria	1	Good	Low	Same Marine Plan Area	13.53	**22.79**
1	Fairly poor	Low	9	0.6	Artificial littoral biogenic reefs	0.4	Good	Low	0.46	Littoral biogenic reefs - Sabellaria	0.6	Good	Low	8.12	Littoral biogenic reefs - Sabellaria	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Sabellaria	1	Good	Low	Same Marine Plan Area	13.53	**18.52**

1	Fairly poor	Low	9	0.4	Artificial littoral biogenic reefs	0.6	Good	Low	0.7	Littoral biogenic reefs - Sabellaria	0.4	Good	Low	5.41	Littoral biogenic reefs - Sabellaria	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Sabellaria	1	Good	Low	Same Marine Plan Area	13.53	**14.24**
1	Fairly poor	Low	9	0.2	Artificial littoral biogenic reefs	0.8	Good	Low	0.93	Littoral biogenic reefs - Sabellaria	0.2	Good	Low	2.71	Littoral biogenic reefs - Sabellaria	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Sabellaria	1	Good	Low	Same Marine Plan Area	13.53	**9.97**
1	Fairly poor	Low	9	0	Artificial littoral biogenic reefs	1	Good	Low	1.16	N/A	N/A	N/A	N/A	N/A	Littoral biogenic reefs - Sabellaria	1	Fairly poor	Low	9	1	Littoral biogenic reefs - Sabellaria	1	Good	Low	Same Marine Plan Area	13.53	**5.69**

Table 36: *Artificial littoral biogenic reef calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 15 years, offsite enhancement TTT is 8 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	
1	Fairly poor	Low	3	1	N/A	N/A	N/A	N/A	N/A	Artificial littoral biogenic reefs	1	Good	Low	4.51	Artificial littoral biogenic reefs	1	Fairly poor	Low	3	1	Artificial littoral biogenic reefs	1	Good	Low	Same Marine Plan Area	4.51	**9.02**
1	Fairly poor	Low	3	0.8	Artificial littoral biogenic reefs	0.2	Good	Low	0.23	Artificial littoral biogenic reefs	1	Good	Low	3.61	Artificial littoral biogenic reefs	1	Fairly poor	Low	3	1	Artificial littoral biogenic reefs	1	Good	Low	Same Marine Plan Area	4.51	**7.75**
1	Fairly poor	Low	3	0.6	Artificial littoral biogenic reefs	0.4	Good	Low	0.46	Artificial littoral biogenic reefs	1	Good	Low	2.71	Artificial littoral biogenic reefs	1	Fairly poor	Low	3	1	Artificial littoral biogenic reefs	1	Good	Low	Same Marine Plan Area	4.51	**6.48**

1	Fairly poor	Low	3	0.4	Artificial littoral biogenic reefs	0.6	Good	Low	0.7	Artificial littoral biogenic reefs	1	Good	Low	1.8	Artificial littoral biogenic reefs	1	Fairly poor	Low	3	1	Artificial littoral biogenic reefs	1	Good	Low	Same Marine Plan Area	4.51	**5.21**
1	Fairly poor	Low	3	0.2	Artificial littoral biogenic reefs	0.8	Good	Low	0.93	Artificial littoral biogenic reefs	1	Good	Low	0.9	Artificial littoral biogenic reefs	1	Fairly poor	Low	3	1	Artificial littoral biogenic reefs	1	Good	Low	Same Marine Plan Area	4.51	**3.94**
1	Fairly poor	Low	3	0	Artificial littoral biogenic reefs	1	Good	Low	1.16	N/A	N/A	N/A	N/A	N/A	Artificial littoral biogenic reefs	1	Fairly poor	Low	3	1	Artificial littoral biogenic reefs	1	Good	Low	Same Marine Plan Area	4.51	**2.67**

7.4 Appendix D: Grassland Habitats

Table 37: *Traditional orchids calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Worth noting that instead of a Marine Plan Area (in saltmarsh, seagrass and biogenic reef habitats) it is Landscape Protection Area (LPA) and Nature Conservation Area (NCA) but have the same multipliers as the Marine Plan Area (x1, x0.75 and x0.5). Onsite creation TTT is 30 years, onsite and offsite enhancement TTT is 20 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Traditional Orchards	1	Good	Low	11.96	Traditional Orchards	1	Fairly poor	Low	9	1	Traditional Orchards	1	Good	Low	Inside LPA or NCA	11.96	**23.91**
1	Fairly poor	Low	9	0.5	Traditional Orchards	0.5	Good	Low	3.09	Traditional Orchards	0.5	Good	Low	5.98	Traditional Orchards	1	Fairly poor	Low	9	1	Traditional Orchards	1	Good	Low	Inside LPA or NCA	11.96	**16.53**
1	Fairly poor	Low	9	0	Traditional Orchards	1	Good	Low	6.18	N/A	N/A	N/A	N/A	N/A	Traditional Orchards	1	Fairly poor	Low	9	1	Traditional Orchards	1	Good	Low	Inside LPA or NCA	11.96	**9.14**

Table 38: *Flood wetland mosaic (CFGM) calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 20 years, onsite and offsite enhancement TTT is 7 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Spatial risk category	Habitat Units Delivered	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Flood Wetland Mosaic (CFGM)	1	Good	Low	13.7	Flood Wetland Mosaic (CFGM)	1	Fairly poor	Low	9	1	Flood Wetland Mosaic (CFGM)	1	Good	Low	Inside LPA or NCA	13.7	**27.4**
1	Fairly poor	Low	9	0.5	Flood Wetland Mosaic (CFGM)	0.5	Good	Low	1.46	Flood Wetland Mosaic (CFGM)	1	Good	Low	6.85	Flood Wetland Mosaic (CFGM)	1	Fairly poor	Low	9	1	Flood Wetland Mosaic (CFGM)	1	Good	Low	Inside LPA or NCA	13.7	**17.51**
1	Fairly poor	Low	9	0	Flood Wetland Mosaic (CFGM)	1	Good	Low	2.91	N/A	N/A	N/A	N/A	N/A	Flood Wetland Mosaic (CFGM)	1	Fairly poor	Low	9	1	Flood Wetland Mosaic (CFGM)	1	Good	Low	Inside LPA or NCA	13.7	**7.61**

Table 39: *Lowland calcareous grassland calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 20 years, onsite and offsite enhancement TTT is 15 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Lowland Calcareous Grassland	1	Good	Low	10.74	Lowland Calcareous Grassland	1	Fairly poor	Low	9	1	Lowland Calcareous Grassland	1	Good	Low	Inside LPA or NCA	10.74	**21.48**
1	Fairly poor	Low	9	0.5	Lowland Calcareous Grassland	0.5	Good	Low	1.46	Lowland Calcareous Grassland	1	Good	Low	5.37	Lowland Calcareous Grassland	1	Fairly poor	Low	9	1	Lowland Calcareous Grassland	1	Good	Low	Inside LPA or NCA	10.74	**13.07**
1	Fairly poor	Low	9	0	Lowland Calcareous Grassland	1	Good	Low	2.91	N/A	N/A	N/A	N/A	N/A	Lowland Calcareous Grassland	1	Fairly poor	Low	9	1	Lowland Calcareous Grassland	1	Good	Low	Inside LPA or NCA	10.74	**4.65**

Table 40: *Lowland dry acid grassland calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 30+ years, onsite and offsite enhancement TTT is 25 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Spatial risk category	Habitat Units Delivered	
1	Fairly poor	Low	12	1	N/A	N/A	N/A	N/A	N/A	Lowland Dry Acid Grassland	1	Good	Low	13.63	Lowland Dry Acid Grassland	1	Fairly poor	Low	12	1	Lowland Dry Acid Grassland	1	Good	Low	Inside LPA or NCA	13.63	**3.25**
1	Fairly poor	Low	12	0.5	Lowland Dry Acid Grassland	0.5	Good	Low	1.27	Lowland Dry Acid Grassland	1	Good	Low	6.81	Lowland Dry Acid Grassland	1	Fairly poor	Low	12	1	Lowland Dry Acid Grassland	1	Good	Low	Inside LPA or NCA	13.63	**3.7**
1	Fairly poor	Low	12	0	Lowland Dry Acid Grassland	1	Good	Low	ANY LOSS UNNACCEPTABLE	N/A	N/A	N/A	N/A	N/A	Lowland Dry Acid Grassland	1	Fairly poor	Low	12	1	Lowland Dry Acid Grassland	1	Good	Low	Inside LPA or NCA	13.63	**UNACCEPTABLE LOSS**

Table 41: *Tall herb communities calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 30 years, onsite and offsite enhancement TTT is 15 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Spatial risk category	Habitat Units Delivered	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Tall Herb Communities	1	Good	Low	10.74	Tall Herb Communities	1	Fairly poor	Low	9	1	Tall Herb Communities	1	Good	Low	Inside LPA or NCA	10.74	**21.48**
1	Fairly poor	Low	9	0.5	Tall Herb Communities	0.5	Good	Low	1.02	Tall Herb Communities	1	Good	Low	5.37	Tall Herb Communities	1	Fairly poor	Low	9	1	Tall Herb Communities	1	Good	Low	Inside LPA or NCA	10.74	**12.63**
1	Fairly poor	Low	9	0	Tall Herb Communities	1	Good	Low	2.04	N/A	N/A	N/A	N/A	N/A	Tall Herb Communities	1	Fairly poor	Low	9	1	Tall Herb Communities	1	Good	Low	Inside LPA or NCA	10.74	**3.78**

Table 42: *Upland calcareous grassland calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 25 years, onsite and offsite enhancement TTT is 18 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Upland Calcareous Grassland	1	Good	Low	10.56	Upland Calcareous Grassland	1	Fairly poor	Low	9	1	Upland Calcareous Grassland	1	Good	Low	Inside LPA or NCA	10.56	**21.13**
1	Fairly poor	Low	9	0.5	Upland Calcareous Grassland	0.5	Good	Low	1.22	Upland Calcareous Grassland	1	Good	Low	5.28	Upland Calcareous Grassland	1	Fairly poor	Low	9	1	Upland Calcareous Grassland	1	Good	Low	Inside LPA or NCA	10.56	**12.56**
1	Fairly poor	Low	9	0	Upland Calcareous Grassland	1	Good	Low	2.44	N/A	N/A	N/A	N/A	N/A	Upland Calcareous Grassland	1	Fairly poor	Low	9	1	Upland Calcareous Grassland	1	Good	Low	Inside LPA or NCA	10.56	**4**

Table 43: *Upland hay meadows calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 20 years, onsite and offsite enhancement TTT is 18 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Habitat Units Delivered	Habitat Type	Area (ha)	Condition	Strategic significance	Units worth	Area retained (ha)	Habitat Type	Area enhanced (ha)	Condition	Strategic significance	Spatial risk category	Habitat Units Delivered	
1	Fairly poor	Low	12	1	N/A	N/A	N/A	N/A	N/A	Upland Hay Meadows	1	Good	Low	16.23	Upland Hay Meadows	1	Fairly poor	Low	12	1	Upland Hay Meadows	1	Good	Low	Inside LPA or NCA	16.23	**8.47**
1	Fairly poor	Low	12	0.5	Upland Hay Meadows	0.5	Good	Low	1.94	Upland Hay Meadows	1	Good	Low	8.12	Upland Hay Meadows	1	Fairly poor	Low	12	1	Upland Hay Meadows	1	Good	Low	Inside LPA or NCA	16.23	**8.29**
1	Fairly poor	Low	12	0	Upland Hay Meadows	1	Good	Low	ANY LOSS UNNACCEPTABLE	N/A	N/A	N/A	N/A	N/A	Upland Hay Meadows	1	Fairly poor	Low	12	1	Upland Hay Meadows	1	Good	Low	Inside LPA or NCA	16.23	**UNACCEPTABLE LOSS**

7.5 Appendix E: Heathland and shrub habitats

Table 44: *Lowland heathland calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 30+ years, onsite and offsite enhancement TTT is 20 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						Total Units Earned
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Lowland Heathland	1	Good	Low	11.96	Lowland Heathland	1	Fairly poor	Low	9	1	Lowland Heathland	1	Good	Low	Inside LPA or NCA	11.96	**23.91**
1	Fairly poor	Low	9	0.5	Lowland Heathland	0.5	Good	Low	0.95	Lowland Heathland	0.5	Good	Low	6.96	Lowland Heathland	1	Fairly poor	Low	9	1	Lowland Heathland	1	Good	Low	Inside LPA or NCA	11.96	**14.39**
1	Fairly poor	Low	9	0	Lowland Heathland	1	Good	Low	1.9	N/A	N/A	N/A	N/A	N/A	Lowland Heathland	1	Fairly poor	Low	9	1	Lowland Heathland	1	Good	Low	Inside LPA or NCA	11.96	**4.86**

Table 45: *Mountain heaths and willow scrubs calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 30+ years, onsite and offsite enhancement TTT is 30+ years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	**Total Units Earned**
1	Fairly poor	Low	12	1	N/A	N/A	N/A	N/A	N/A	Mountain Heaths & Willow Scrub	1	Good	Low	13.27	Mountain Heaths & Willow Scrub	1	Fairly poor	Low	12	1	Mountain Heaths & Willow Scrub	1	Good	Low	Inside LPA or NCA	13.27	**2.53**
1	Fairly poor	Low	12	0.5	Mountain Heaths & Willow Scrub	0.5	Good	Low	1.27	Mountain Heaths & Willow Scrub	0.5	Good	Low	6.63	Mountain Heaths & Willow Scrub	1	Fairly poor	Low	12	1	Mountain Heaths & Willow Scrub	1	Good	Low	Inside LPA or NCA	13.27	**3.17**
1	Fairly poor	Low	12	0	Mountain Heaths & Willow Scrub	1	Good	Low	2.53	N/A	N/A	N/A	N/A	N/A	Mountain Heaths & Willow Scrub	1	Fairly poor	Low	12	1	Mountain Heaths & Willow Scrub	1	Good	Low	Inside LPA or NCA	13.27	**ANY LOSS UNACCEPTABLE**

Table 46: *Sea buckthorn scrub (Annex 1) calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 30 years, onsite and offsite enhancement TTT is 30 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	**Total Units Earned**
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Sea Buckthorn Scrub (Annex 1)	1	Good	Low	15.3	Sea Buckthorn Scrub (Annex 1)	1	Fairly poor	Low	9	1	Sea Buckthorn Scrub (Annex 1)	1	Good	Low	Inside LPA or NCA	15.3	**30.61**
1	Fairly poor	Low	9	0.5	Sea Buckthorn Scrub (Annex 1)	0.5	Good	Low	4.22	Sea Buckthorn Scrub (Annex 1)	0.5	Good	Low	7.65	Sea Buckthorn Scrub (Annex 1)	1	Fairly poor	Low	9	1	Sea Buckthorn Scrub (Annex 1)	1	Good	Low	Inside LPA or NCA	15.3	**22.68**
1	Fairly poor	Low	9	0	Sea Buckthorn Scrub (Annex 1)	1	Good	Low	8.45	N/A	N/A	N/A	N/A	N/A	Sea Buckthorn Scrub (Annex 1)	1	Fairly poor	Low	9	1	Sea Buckthorn Scrub (Annex 1)	1	Good	Low	Inside LPA or NCA	15.3	**14.75**

Table 47: *Upland heathland calculations of the BNG metric. This focused on the onsite creation and enhancement with offsite enhancement being consistent throughout. Onsite creation TTT is 10 years, onsite and offsite enhancement TTT is 10 years.*

A1- Onsite Habitat Baseline					A2- Onsite Habitat Creation					A3- Onsite Habitat Enhancement					D-1 Offsite Habitat Baseline						D-3 Offsite Habitat Enhancement						
Area (ha)	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Habitat Units Delivered**	**Habitat Type**	**Area (ha)**	**Condition**	**Strategic significance**	**Units worth**	**Area retained (ha)**	**Habitat Type**	**Area enhanced (ha)**	**Condition**	**Strategic significance**	**Spatial risk category**	**Habitat Units Delivered**	**Total Units Earned**
1	Fairly poor	Low	9	1	N/A	N/A	N/A	N/A	N/A	Upland Heathland	1	Good	Low	11.07	Upland Heathland	1	Fairly poor	Low	9	1	Upland Heathland	1	Good	Low	Inside LPA or NCA	11.07	**22.14**
1	Fairly poor	Low	9	0.5	Upland Heathland	0.5	Good	Low	2.07	Upland Heathland	0.5	Good	Low	5.54	Upland Heathland	1	Fairly poor	Low	9	1	Upland Heathland	1	Good	Low	Inside LPA or NCA	11.07	**14.18**
1	Fairly poor	Low	9	0	Upland Heathland	1	Good	Low	4.14	N/A	N/A	N/A	N/A	N/A	Upland Heathland	1	Fairly poor	Low	9	1	Upland Heathland	1	Good	Low	Inside LPA or NCA	11.07	**6.21**

End of report