Costed Model for Possible Biodiversity Offsetting/Habitat Banking Schemes in Lichfield District Council

Modelled Parameters & Assumptions:

Assumptions
All arisings from Lowland Meadow, Heathland Mosaic and Wetland Mosaic to be removed from site.
Habitat creation, enhancement and subsequent management to occur over a period of 30 years
Habitat creation, enhancement options will be successful; no financial contingency calculated for corrective works
Compound inflation calculated at +6% for 2023 and then at a subsequent rate of +2.5% per annum across project span
No variance in habitat creation or enhancement costs (within same type), irrespective of location within site
Habitat at commencement is intensively farmed cereal field yielding crop up to start of year 1
Site is easily accessible by tractors and plant
Conservational grazing is not an acceptable management prescription
Annual management monitoring completed by landowner/management company. Pre-start enabling surveys and ecological monitoring completed consultant ecologists
Pre-start cost are uniform across all projects
No Land purchase costs are included

	HABITAT BIO NET GAIN (Biodiversity Units)	Data source
Lowland Meadow	16.69	RT-MME-156525, Metric 3.1, Lowland Meadow Creation Site
Heathland Mosaic	19.72	RT-MME-156525, Metric 3.1, Heathland Mosaic Creation Site
Wetland Mosaic	20.99	RT-MME-156525, Metric 3.1, Wetland Mosaic Creation Site
Woodland Mosaic	18.54	RT-MME-156525, Metric 3.1, Woodland Mosaic Creation Site

	TOTAL AREAS (ha)	Data source
Lowland Meadow	5.00	RT-MME-156525, Metric 3.1, Lowland Meadow Creation Site
Heathland Mosaic	5.00	RT-MME-156525, Metric 3.1, Heathland Mosaic Creation Site
Wetland Mosaic	5.00	RT-MME-156525, Metric 3.1, Wetland Mosaic Creation Site
Woodland Mosaic	5.00	RT-MME-156525, Metric 3.1, Woodland Mosaic Creation Site

Proposed Habitat Management Synopsis

Habitat Creation Project	Project Code	Site Habitat Composition	Area (m^2)	Area (ha)	Creation / Enhancement / Retained
Lowland Meadow	LOW	Lowland meadow	50000.00	5.00	Creation
Heathland Mosaic	HEATH	Lowland heathland	20000.00	2.00	Creation
		Acid grassland	25000.00	2.50	Creation
		Mixed scrub	5000.00	0.50	Creation
Wetland Mosaic	WET	Reedbeds	25000.00	2.50	Creation
		Wet Grassland	25000.00	2.50	Creation
Woodland Mosaic	WOOD	Broadleaved woodland	40000.00	4.00	Creation
		Mixed scrub	10000.00	1.00	Creation
			TOTAL AREA:	20.00	

COST-GAIN ANALYSIS

Project Code	Total Cost	Ave. Cost per ha Over 30 Year Period	Ave. Cost per ha per year	Biodiversity Unit Net Gain	Ave. Cost for Delivery, per Bio Unit over 30 years	Ave. Cost for Delivery, per Bio Unit per year
LOW	£ 395,352.05	£ 79,070.41	£ 2,635.68	16.69	£ 23,687.96	£ 789.60
HEATH	£ 468,356.88	£ 234,178.44	£ 7,805.95	19.72	£ 23,750.35	£ 791.68
WET	£ 478,883.67	£ 191,553.47	£ 6,385.12	20.99	£ 22,814.85	£ 760.49
WOOD	£ 439,541.41	£ 879,082.82	£ 29,302.76	18.54	£ 23,707.74	£ 790.26

Ave. Cost for Delivery, per Bio Unit over 30 years. Across all habitats	With 50% Contingency buffer
£ 23,490.22	£ 35,235.33

	Total Capital Payment For Project at Modelled Sale Price (£K)						Total Capital Payment For Project at Modelled Sale Price - Modelled Delivery Costs (£K)						Profit / Contingency Budget per Annum					
Project Code	15	20	25	30	35	40	15	20	25	30	35	40	15	20	25	30	35	40
LOW	£ 250,350.00	£ 333,800.00	£ 417,250.00	£ 500,700.00	£ 584,150.00	£ 667,600.00	£ 145,002.05	£ 61,552.05	£ 21,897.95	£ 105,347.95	£ 188,797.95	£ 272,247.95	N/A	N/A	£ 729.93	£ 3,511.60	£ 6,293.26	£ 9,074.93
HEATH	£ 295,800.00	£ 394,400.00	£ 493,000.00	£ 591,600.00	£ 690,200.00	£ 788,800.00	£ 172,556.88	£ 73,956.88	£ 24,643.12	£ 123,243.12	£ 221,843.12	£ 320,443.12	N/A	N/A	£ 821.44	£ 4,108.10	£ 7,394.77	£ 10,681.44
WET	£ 314,850.00	£ 419,800.00	£ 524,750.00	£ 629,700.00	£ 734,650.00	£ 839,600.00	£ 164,033.67	£ 59,083.67	£ 45,866.33	£ 150,816.33	£ 255,766.33	£ 360,716.33	N/A	N/A	£ 1,528.88	£ 5,027.21	£ 8,525.54	£ 12,023.88
WOOD	£ 278,100.00	£ 370,800.00	£ 463,500.00	£ 556,200.00	£ 648,900.00	£ 741,600.00	£ 161,441.41	£ 68,741.41	£ 23,958.59	£ 116,658.59	£ 209,358.59	£ 302,058.59	N/A	N/A	£ 798.62	£ 3,888.62	£ 6,978.62	£ 10,068.62

BAD	Negative capital to < £100K
MODERATE	£100K < > £200K
GOOD	£200K <

BAD	£5K >
MODERATE	£5K > < £ 10K
GOOD	£10K <

Parcel ID	Habitats	Item	Notes	Volume (Time / Tons / number/ etc.)	Area (ha) or Distance (m)	Prescription rate	Price per Unit, 2020 Costings (£)	Price per Unit, 2022 Costings, Compound Inflation (2020-22) estimated at 11.19% (£)	Cost £ Pre-start	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	Yr. 11	Yr. 12	Yr. 13	Yr. 14	Yr. 15	Yr. 16	Yr. 17	Yr. 18	Yr. 19	Yr. 20	Yr. 21	Yr. 22	Yr. 23	Yr. 24	Yr. 25	Yr. 26	Yr. 27	Yr. 28	Yr. 29	Yr. 30
N/A	Pre-Commencement	Staff Cost (Land Owner)	Tender creation, site visits with contractors, meetings with LPA	36 hrs	N/A	N/A	variable	variable	2,160.00																														
		Habitat Bank, Ecological Surveys and Enabling Documents	Surveys and reports prepared by ecological consultant	N/A	N/A	Once, at start of project	£ 10,000.00	£ 11,119.00	11,119.00																														
		Preparation of Legal Documents	All legal documents prepared by solicitor	N/A	N/A	Once, at start of project	£ 6,000.00	£ 6,671.40	6,671.40																														
		Hydrological Assessments (Wetland only)	Surveys and reports prepared by hydrological consultant	N/A	N/A	Once, at start of project	£ 10,000.00	£ 11,119.00	11,119.00																														
		Consultation with EA and attainment of planning permission (Wetland only)	Consultant fees for engagement with EA at attainment of planning permission for engineering works	N/A	N/A	Once, at start of project	£ 10,000.00	£ 11,119.00	11,119.00																														
N/A	Lowland Meadow	Reduction of Nutrients in Grassland and Suppression of Ruderal Growth	Suppression of annual weed growth post nutrient release. Two grassland cuts. Arisings removed from site.	N/A	5.00	In years one, two and three. Two cuts per annum	£ 300.00	£ 333.57		3,335.70	3,335.70	3,335.70																										
			Removal of arisings	8.75	5.00	In years one, two and three. Twice per annum	£ 23.00	£ 25.57		2,371.96	2,431.26	2,492.04																										
		Introduction of Appropriate Wildflower and Grass Seed	Chain harrowing of grassland to provide 90% bare soil for green-hay seeding	N/A	5.00	Once, in third year of project	£ 1,500.00	£ 1,667.85				1,857.42																										
			Seed Purchase, Meadow Mixture, (EM$_5$)	40.0 kg per ha	5.00	Once, in third year of project	NA	£ 10,520.00				11,715.73																										
			Yellow rattle seed to reduce vigour of existing coarse grasses	0.25 kg per ha	5.00	Once, in third year of project	NA	£ 93.50				520.64																										
			Sowing of seed via tractor	N/A	5.00	Once, in third year of project	£ 1,500.00	£ 1,667.85				1,857.42																										
		Yearly Cut and Collect	Hay cut, Arisings removed from site.	N/A	5.00	Once per annum	£ 300.00	£ 333.57					1,903.86	1,951.45	2,000.24	2,050.25	2,101.50	2,154.04	2,207.89	2,263.09	2,319.67	2,377.66	2,437.10	2,498.03	2,560.48	2,624.49	2,690.10	2,757.35	2,826.29	2,896.94	2,969.37	3,043.60	3,119.69	3,197.68	3,277.63	3,359.57	3,443.56	3,529.65	3,617.89
			Removal of arisings	8.75	5.00	Once per annum	£ 23.00	£ 25.57					1,277.17	1,309.10	1,341.83	1,375.37	1,409.76	1,445.00	1,481.13	1,518.16	1,556.11	1,595.01	1,634.89	1,675.76	1,717.65	1,760.59	1,804.61	1,849.72	1,895.97	1,943.37	1,991.95	2,041.75	2,092.79	2,145.11	2,198.74	2,253.71	2,310.05	2,367.80	2,427.00
N/A	Lowland Heathland Mosaic	Soil inversion	Scraping of topsoil (up to 0.5m depth) and reburial onsite to reduce nutrients and expose sandy sub-surface layer	N/A	5.00	Once, in year one of project	N/A	£ 10,000.00		10,000.00																													
		Collection and transport of Heather and acid grassland seed	Cutting, bailing and transport of locally sourced heather and acid grassland seed	N/A	5.00	Once, in year one of project	N/A	£ 10,000.00		10,000.00																													
		Spreading of seed	Bails broken up and then spread via chain harrow	N/A	5.00	Once, in year one of project	N/A	£ 5,000.00		5,000.00																													
		Scrub Clearance	Cutting and clearance of scrub. Cost include stump treatment and clearance of arisings	N/A	1.00	Once every 4 years	£ 4,000.00	£ 4,447.60					5,076.95				5,604.01				6,185.77				6,827.94				7,536.77				8,319.18				9,182.82		
		Cut and Collect of Acid Grassland	Hay cut. Arisings removed from site. Cost provided are per cut.	N/A	2.50	Once per annum	£ 250.00	£ 277.98		736.63	755.05	773.93	793.27	813.11	833.43	854.27	875.63	897.52	919.95	942.95	966.53	990.69	1,015.46	1,040.84	1,066.87	1,093.54	1,120.88	1,148.90	1,177.62	1,207.06	1,237.24	1,268.17	1,299.87	1,332.37	1,365.68	1,399.82	1,434.82	1,470.69	1,507.45
			Removal of arisings	8.75	2.50	Once per annum	£ 23.00	£ 25.57		592.99	607.81	623.01	638.59	654.55	670.91	687.69	704.88	722.50	740.56	759.08	778.05	797.51	817.44	837.88	858.83	880.30	902.30	924.86	947.98	971.68	995.98	1,020.87	1,046.40	1,072.56	1,099.37	1,126.85	1,155.03	1,183.90	1,213.50
		Fire Breaks	Cutting of firebreaks across site using tractor mounted flail. Four breaks across site(10m in width)	N/A	N/A	Once per annum	£ 1,500.00	£ 1,667.85			1,812.12	1,857.42	1,903.86	1,951.45	2,000.24	2,050.25	2,101.50	2,154.04	2,207.89	2,263.09	2,319.67	2,377.66	2,437.10	2,498.03	2,560.48	2,624.49	2,690.10	2,757.35	2,826.29	2,896.94	2,969.37	3,043.60	3,119.69	3,197.68	3,277.63	3,359.57	3,443.56	3,529.65	3,617.89
		Bracken control	Treatment of bracken with Asulox	N/A	1.00	Once every other year (starting in year 4)	£ 600.00	£ 667.14					761.54		800.10		840.60		883.16		927.87		974.84		1,024.19		1,076.04		1,130.51		1,187.75		1,247.88		1,311.05		1,377.42		1,447.15
		Heather Cutting	Cutting of Heather with tractor mounted flail to create age structure	10% of heather cut to pioneer height	0.50	Once every 3 years (starting in year 4)	£ 500.00	£ 555.95					317.31			341.71			367.98			396.28			426.75			459.56			494.89			532.95			573.93		
N/A	Wetland Mosaic	Site Preparation	Soil Extraction, Translocation, and Grading	8 days	2.50	Once in year one of project	£ 1,500.00	£ 1,667.85		14,143.37																													
			Installation of water flow management infrastructure (drop-board sluice etc.)	N/A	N/A	Once in year one of project	£ 6,000.00	£ 6,671.40		7,071.68																													
		Reedbed Seeding	Seed cost, common read (Phragmites australis)	30kg per ha	2.50	Once in year one of project	£ 50.00	£ 55.60		4,419.80																													
			Sowing of seed via tractor or quad	N/A	N/A	Once in year one of project	£ 1,500.00	£ 1,678.50		1,779.21																													
		Reduction of Nutrients in Wet Grassland area and Suppression of Ruderal Growth	Suppression of annual weed growth post nutrient release. Two grassland cuts. Arisings removed from site.	N/A	2.50	In years one, two and three. Two cuts per annum	£ 1,500.00	£ 1,667.85		3,535.84	3,624.24	3,714.84																										
			Removal of arisings	8.75	2.50	In years one, two and three. Two cuts per annum	£ 23.00	£ 25.57		1,185.98	1,215.63	1,246.02																										
		Introduction of Appropriate Wet Grassland Seed	Chain harrowing of grassland to provide 90% bare soil for green-hay seeding	N/A	2.50	Once, in third year of project	£ 1,500.00	£ 1,667.85				1,857.42																										
			Seed Purchase, Wetland Mixture, (N7G)	50kg per ha	2.50	Once, in third year of project	N/A	£ 20.00				2,784.16																										
		Cut and Collect of Reedbed	Flailing of reeds	10% of reedbed per annum	2.50	Once per annum, commencing in fourth year of project	£ 1,500.00	£ 1,667.85					1,903.86	1,951.45	2,000.24	2,050.25	2,101.50	2,154.04	2,207.89	2,263.09	2,319.67	2,377.66	2,437.10	2,498.03	2,560.48	2,624.49	2,690.10	2,757.35	2,826.29	2,896.94	2,969.37	3,043.60	3,119.69	3,197.68	3,277.63	3,359.57	3,443.56	3,529.65	3,617.89
		Cut and Collect of Wet Grassland	Hay cut, Arisings removed from site.	N/A	2.50	Once per annum, commencing in fourth year of project	£ 1,500.00	£ 1,667.85					1,903.86	1,951.45	2,000.24	2,050.25	2,101.50	2,154.04	2,207.89	2,263.09	2,319.67	2,377.66	2,437.10	2,498.03	2,560.48	2,624.49	2,690.10	2,757.35	2,826.29	2,896.94	2,969.37	3,043.60	3,119.69	3,197.68	3,277.63	3,359.57	3,443.56	3,529.65	3,617.89
			Removal of arisings	8.75	2.50	Once per annum, commencing in fourth year of project	£ 23.00	£ 25.57					638.59	654.55	670.91	687.69	704.88	722.50	740.56	759.08	778.05	797.51	817.44	837.88	858.83	880.30	902.30	924.86	947.98	971.68	995.98	1,020.87	1,046.40	1,072.56	1,099.37	1,126.85	1,155.03	1,183.90	1,213.50
N/A	Woodland Mosaic	Woodland Planting and Beating up	PLANTING Whip cost (with tree shelters). Approx 1 per 10m2/ 1000 per ha.	5000	5.00	Once in year 1	£ 1.00	£ 1.11		5,893.07																													
			PLANTING New trees notch planted at rate of 200 per day per individual. At staff rate (September-October)	25	5.00	Once in year 1	variable	variable		11,531.25																													
			BEATING UP Assumed 10% failure rate of original planting. Whip costs	500	0.50	Once in year 5	£ 1.00	£ 1.11						650.48																									
			BEATING UP New trees notch planted at rate of 200 per day per individual, At Staff rate (September-October)	2.5	0.50	Once it year 5	variable	variable						1,272.83																									
		Ruderal Control During Establishment of New Woodland Areas	Maintain weed-free area approx. 1m in diameter around base of newly planted trees. Glyphosate application, quad mounted tank and wand (April), first three years post planting	N/A	variable	For three years post planting	£ 600.00	£ 667.14			3,624.24	3,714.84	3,807.72		400.05	410.05	420.30																						
		Watering During Establishment of New Woodland Areas	Watering provision through June-August for the first three years post planting	N/A	variable	For three years post planting	£ 600.00	£ 667.14			3,624.24	3,714.84	3,807.72		400.05	410.05	420.30																						
		Mechanical Ruderal Control	Removal of brambles / thistles / nettles with hand tools For health and safety reason a team of two people will be required.	N/A	5.00	Every other year after establishment (starting in year 5)	£ 1,000.00	£ 1,111.90						6,504.85		6,834.15		7,180.13		7,543.63		7,925.52		8,326.75		8,748.30		9,191.18		9,656.48		10,145.34		10,658.95		11,198.56		11,765.48	
		Ongoing Woodland Management	Removal of selected trees within existing woodland areas to create canopy gaps and promote improved age structure. All arising stacked into habitat piles on site within woodland areas September-February	10% of woodland area	0.50	Once every 5 years	£ 8,000.00	£ 8,895.20											5,887.71					6,661.40					7,536.77				8,527.16						9,647.70
N/A	Ecological Monitoring and Project Management	Ecological Monitoring	Monitoring carried out by ecological consultant	N/A	N/A	N/A	NA	£ 2,500.00			2,716.25			2,925.10					3,309.49					3,744.38					4,236.42				4,793.12					5,422.98
		Annual Management Monitoring and Project Management	At staff costs	72 hrs for monitoring per annum, inclusive of reporting	N/A	Annual	variable	variable		4,428.00	4,538.70	4,652.17	4,768.47	4,887.68	5,009.88	5,135.12	5,263.50	5,395.09	5,529.97	5,668.21	5,809.92	5,955.17	6,104.05	6,256.65	6,413.06	6,573.39	6,737.73	6,906.17	7,078.82	7,255.79	7,437.19	7,623.12	7,813.70	8,009.04	8,209.26	8,414.50	8,624.86	8,840.48	9,061.49

	Pre-start	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5	Yr. 6	Yr. 7	Yr. 8	Yr. 9	Yr. 10	Yr. 11	Yr. 12	Yr. 13	Yr. 14	Yr. 15	Yr. 16	Yr. 17	Yr. 18	Yr. 19	Yr. 20	Yr. 21	Yr. 22	Yr. 23	Yr. 24	Yr. 25	Yr. 26	Yr. 27	Yr. 28	Yr. 29	Yr. 30
Inflation Multiplier (+2.5% per annum)	0	1.060	1.087	1.114	1.142	1.170	1.199	1.229	1.260	1.292	1.324	1.357	1.391	1.426	1.461	1.498	1.535	1.574	1.613	1.653	1.695	1.737	1.780	1.825	1.870	1.917	1.965	2.014	2.065	2.116	2.169
Hourly Staff Cost (£) Inc Overheads	60	61.50	63.04	64.61	66.23	67.88	69.58	71.32	73.10	74.93	76.81	78.73	80.69	82.71	84.78	86.90	89.07	91.30	93.58	95.92	98.32	100.77	103.29	105.88	108.52	111.24	114.02	116.87	119.79	122.78	125.85
Total / Annum £ — Project Code																															
Low	19,950.40	10135.66	13021.91	26431.12	7949.50	11073.34	8351.94	8560.74	8774.76	8994.13	12528.47	9449.46	9685.69	9927.84	10176.03	14174.81	10691.19	10958.47	11232.44	11513.25	16037.50	12096.10	12398.51	12708.47	13026.18	18144.96	13685.63	14027.77	14378.47	14737.93	20529.36
Heath	19,950.40	10757.62	10429.93	7906.53	14259.99	11231.90	9314.56	9069.03	13390.12	9169.15	13959.00	9633.33	16887.81	10517.30	11348.89	14377.78	19178.11	11171.71	12527.05	12196.84	24934.42	12331.48	14322.41	12955.76	22846.71	18937.72	15262.99	14000.74	25792.42	15024.71	22270.47
Wet	42,188.40	36563.89	13094.82	14254.61	9214.77	12370.25	9681.27	9923.30	10171.38	10425.67	13995.80	10953.47	11227.31	11507.99	11795.69	15834.96	12392.84	12702.67	13020.23	13345.74	17915.80	14021.37	14371.90	14731.20	15099.48	20270.09	15863.89	16260.49	16667.00	17083.67	23933.74
Wood	19,950.40	23,852.32	14,503.43	12,081.86	12,383.90	16,240.95	5,809.97	12,789.38	6,104.10	12,575.22	14,727.16	13,211.84	5,809.92	13,880.69	6,104.05	24,989.19	6,413.06	15,321.69	6,737.73	16,097.35	18,852.01	16,912.27	7,437.19	17,768.46	7,813.70	31,988.27	8,209.26	19,613.05	8,624.86	20,605.96	24,132.17