

What does the BEACH tool do?

The BEACH tool (Benefit Evaluation through Assessment of Component Habitats) is an Excel-based tool that was developed to support the NI-MANACA project.

It automates the process of transferring UK-scale (annualised) valuations to a range of scales within the Northern Ireland marine area by:

- (i) disaggregating UK-scale benefit valuations – according to the relative abundance of each constituent EUNIS (level 3) habitat type, and the intrinsic value of each habitat type for each benefit stream (as outlined by the assessments within the matrix approach; Potts et al., 2014) and ...
- (ii) subsequently re-aggregating the derived ‘transfer’ values for each specific habitat/benefit combination on the basis of the extent of each constituent EUNIS (level 3) habitat type present within discrete target areas across a range of possible scales within the Northern Ireland marine area ...
- (iii) so producing derived annualised valuations for services/benefits at the new (target) scale.

This basic benefit transfer functionality is augmented to account for changes in value that might be expected as the result of protection/management measures, allowing forward projections of values under defined conditions to be made. This is achieved by:

- (iv) applying predefined curves/profiles - describing potential changes in habitat condition (and hence in the value of associated benefit streams) under different management options (i.e., do-nothing, within unmanaged (unprotected) areas; and active management against either ‘maintain’ or ‘recover’ conservation objectives, within designated MPAs) ...
- (v) producing derived estimates of the nominal annualised value of each habitat/benefit stream combination, for each of the next 20 years ...
- (vi) and then discounting these nominal annual values (using a 3.5% annual discount rate) ...
- (vii) before summing the discounted values across all 20 years to generate discounted 20-year Net Present Value (NPV) estimates for each individual habitat/benefit combination at the new target scale.

The BEACH tool 'Controls & Inputs' tab (shaded purple) has four key areas (see below):

1: Valuation data at national scale

4: Summary outputs

3: Management of MPA network (balance of 'maintain' vs 'recover')

2: Habitat breakdown at national, regional (BBT), & embedded MPA scales

MARBEFES BEACH - Benefit Evaluation through Assessment of Component Habitats (B. v6.1)
Tool layout and algorithms © Steve Barnard, Wolds Environmental Consulting Ltd., 2024

BBT area:

Societal benefit	Basis for disaggregating benefit value across habitats (after Moran et al., 2008)	Current value of societal benefits at the national scale: €m (2019 prices)		
		Lower estimate	Most likely	Upper estimate
Food (wild, farmed)	A	€ 289.88	€ 289.88	€ 289.88
Fish feed (wild, farmed, bait)	A	€ -	€ -	€ -
Fertiliser and biofuels	A	€ -	€ -	€ -
Ornaments and aquaria	D	€ -	€ -	€ -
Medicines and blue biotechnology	D	€ -	€ -	€ -
Healthy climate	A	€ 736.84	€ 2,489.44	€ 4,242.04
Prevention of coastal erosion	A	€ -	€ -	€ -
Sea defence	A	€ 4.52	€ 9.05	€ 13.57
Waste burial / removal / neutralisation	A	€ 683.33	€ 683.33	€ 683.33
Tourism and nature watching	A	€ 1,725.74	€ 1,725.74	€ 1,725.74
Spiritual and cultural well-being	D	€ -	€ -	€ -
Aesthetic benefits	A	€ 101.06	€ 101.06	€ 101.06
Education and Research	A	€ 2,765.64	€ 2,765.64	€ 2,765.64
Combined health benefits (phys AND psych)	A	€ 248.26	€ 833.20	€ 1,047.46
Physical health benefits	A	€ -	€ -	€ -
Psychological health benefits	B	€ -	€ -	€ -
Total overall value		€ 6,549.28	€ 8,895.34	€ 10,862.71

HIGH LEVEL OUTPUT SUMMARY VALUES (€m)		
	2019 value	NPV (30yr)
National waters	€ 8,891.34	- not applicable -
Indesignated regional (BBT) waters	€ 40.73	€ 556.59
MPAs within BBT - MAINTAIN mgmnt (100%)	€ 27.86	€ 402.86
MPAs within BBT - RECOVER mgmnt (0%)	€ -	€ -
BBT total (= un-designated + included MPAs)	€ 68.59	€ 959.45

How is the existing, designated NI MPA network protected/managed?
In general terms, for what % of the overall MPA network is the conservation objective 'Maintain', and for what % is it 'Recover'?

MAINTAIN mgmnt (100%) RECOVER mgmnt (0%)

MARINE AREAS BY COUNTRY, BROKEN DOWN BY HABITAT TYPES	Est. area (ha), by EUNIS habitat type			Undesignated BBT waters = 'regional' - MPAs (ha)	MPAs included within BBT (ha)	
	Habitat breakdown at national scale (ha)	Habitat breakdown at regional (BBT) scale (ha)	Habitat breakdown at BBT MPA scale (ha)		MAINTAIN mgmnt (100%)	RECOVER mgmnt (0%)
A1.1 - High energy littoral rock	4,355.2	946.2	90.4	255.8	90.4	0.0
A1.2 - Moderate energy littoral rock	6,838.8	640.4	329.7	312.7	329.7	0.0
A1.3 - Low energy littoral rock	10,562.4	1,030.9	402.1	608.8	402.1	0.0
A2.1 - Littoral coarse sediment	7,341.5	55.6	16.9	38.7	16.9	0.0
A2.2 - Littoral sand and muddy sand	163,787.9	5,496.9	538.7	4,958.2	538.7	0.0
A2.3 - Littoral mud	83,078.5	4,676.2	470.2	4,205.9	470.2	0.0
A2.4 - Littoral mixed sediments	10,871.6	3,588.8	1,246.1	2,262.7	1,246.1	0.0
A2.5 - Coastal saltmarshes and saline reedbeds	18,088.7	3,108.2	1,005.4	2,102.8	1,005.4	0.0
A2.6 - Littoral sediments dominated by aquatic angiosperms	2,013.4	0.0	0.0	0.0	0.0	0.0
A2.7 - Littoral biogenic reefs	4,513.0	0.0	0.0	0.0	0.0	0.0
A3.1 - Atlantic and Mediterranean high energy infralittoral rock	162,651.3	1,008.3	739.8	269.6	739.8	0.0
A3.2 - Atlantic and Mediterranean moderate energy infralittoral rock	101,398.6	2,712.4	1,970.7	741.7	1,970.7	0.0
A3.3 - Atlantic and Mediterranean low energy infralittoral rock	49,085.7	1,024.6	880.2	126.3	880.2	0.0
A4.1 - Atlantic and Mediterranean high energy circalittoral rock	678,527.2	3,311.8	2,002.3	1,309.5	2,002.3	0.0
A4.2 - Atlantic and Mediterranean moderate energy circalittoral rock	662,104.8	19,632.7	14,929.6	4,703.1	14,929.6	0.0
A4.3 - Atlantic and Mediterranean low energy circalittoral rock	158,602.8	5,277.2	4,230.6	1,046.5	4,230.6	0.0
A5.1 - Sublittoral coarse sediment	16,004,205.6	199,947.3	65,063.9	134,883.4	65,063.9	0.0
A5.2 - Sublittoral sand	28,428,987.5	127,248.0	40,630.7	64,637.3	62,630.7	0.0
A5.3 - Sublittoral mud	6,574,079.8	127,833.3	81,463.3	156,370.0	81,463.3	0.0
A5.4 - Sublittoral mixed sediments	1,977,113.3	62,078.8	37,535.4	24,540.3	37,535.4	0.0
A5.5 - Sublittoral macrophyte-dominated sediment	19,195.6	1,283.6	909.4	374.2	909.4	0.0
A5.6 - Sublittoral biogenic reefs	51,092.2	75.0	75.0	0.0	75.0	0.0
A6.1 - Deep-sea rock and artificial hard substrata	681,771.9	0.0	0.0	0.0	0.0	0.0
A6.2 - Deep-sea mixed substrata	5,322,777.0	0.0	0.0	0.0	0.0	0.0
A6.3 - Deep-sea sand	8,463,493.1	0.0	0.0	0.0	0.0	0.0
A6.4 - Deep-sea muddy sand	3,569,707.0	0.0	0.0	0.0	0.0	0.0
A6.5 - Deep-sea mud	20,078,300.6	0.0	0.0	0.0	0.0	0.0
A6.6 - Deep-sea bioturbates	2,270.5	0.0	0.0	0.0	0.0	0.0
Total Area (ha)	89,257,310.4	680,376.0	276,628.5	407,142.1	276,628.4	-

1. Data entry cells for recording benefit valuation data (at national and regional (BBT) scales);
2. Data entry cells for describing the habitat breakdown (at both national and regional (BBT) scales, and for any embedded MPAs);
3. A slider bar to allow the relative balance of management of any MPAs embedded within the BBT to be adjusted between 'maintain' and 'recover';
4. A brief summary output of transferred benefit (annualised valuations) and 20-year Net Present Values, summed across all services/benefits, for a range of target scales.

Operation of the BEACH tool - BEACH Inputs 1: Valuation data

These cells (see Figure below) allow the user to enter estimates of the current value of societal benefits at the national scale (blue-shaded cells) and at the regional (BBT) scale (green-shaded cells). The minimum data that are required to run the tool successfully are the 'Most likely' benefit values as reported at the national scale. There is the option to record lower and/or upper value estimates, although these are not processed in the current version of the tool.

Note that all values are assumed to be recorded in millions of Euros (€m). Also note that, across this worksheet tab, user inputs are flagged using red text.

Societal benefit	Basis for disaggregating benefit value across habitats	Current value of societal benefits at the national scale: €m (2019 prices)		
	(after Hussain et al., 2010)	(Lower estimate)	Most likely	(Upper estimate)
Food (wild, farmed)	A	€ 283.88	€ 283.88	€ 283.88
Fish feed (wild, farmed, bait)	A	€ -	€ -	€ -
Fertiliser and biofuels	A	€ -	€ -	€ -
Ornaments and aquaria	D	€ -	€ -	€ -
Medicines and blue biotechnology	D	€ -	€ -	€ -
Healthy climate	A	€ 736.84	€ 2,489.44	€ 4,242.04
Prevention of coastal erosion	A	€ -	€ -	€ -
Sea defence	A	€ 4.52	€ 9.05	€ 13.57
Waste burial / removal / neutralisation	A	€ 683.33	€ 683.33	€ 683.33
Tourism and nature watching	A	€ 1,725.74	€ 1,725.74	€ 1,725.74
Spiritual and cultural well-being	D	€ -	€ -	€ -
Aesthetic benefits	A	€ 101.06	€ 101.06	€ 101.06
Education and Research	A	€ 2,765.64	€ 2,765.64	€ 2,765.64
Combined health benefits (phys AND psych)	A	€ 248.26	€ 833.20	€ 1,047.46
Physical health benefits	A	€ -	€ -	€ -
Psychological health benefits	B	€ -	€ -	€ -
Total overall value		€ 6,549.28	€ 8,891.34	€ 10,862.71

BEACH Inputs 2: Habitat breakdowns

These data input cells allow the user to input the habitat breakdown (as hectares; ha) by EUNIS (level 3) habitat classes across each of three different scales: the national scale (blue-shaded cells); the regional (BBT) scale (green-shaded cells); and for any embedded MPAs (red-shaded cells). These data are typically produced as outputs from a GIS project.

Note that the entries to the right (in black text) are produced automatically from the user inputs in the coloured cells.

MARINE AREAS BY COUNTRY, BROKEN DOWN BY HABITAT TYPES	Est. area (ha), by EUNIS habitat type			Est. area (ha), by EUNIS habitat type		
	Habitat breakdown at national scale (ha)	Habitat breakdown at regional (BBT) scale (ha)	Habitat breakdown at BBT MPA scale (ha)	Undesignated BBT waters = 'regional' - MPAs (ha)	MPAs included within BBT (ha)	
					MAINTAIN mgmnt (100%)	RECOVER mgmnt (0%)
A1.1 - High energy littoral rock	4,855.2	346.2	90.4	255.8	90.4	0.0
A1.2 - Moderate energy littoral rock	6,838.8	642.4	329.7	312.7	329.7	0.0
A1.3 - Low energy littoral rock	10,562.4	1,010.9	402.1	608.8	402.1	0.0
A2.1 - Littoral coarse sediment	7,341.5	55.6	16.9	38.7	16.9	0.0
A2.2 - Littoral sand and muddy sand	163,787.9	5,496.9	538.7	4,958.2	538.7	0.0
A2.3 - Littoral mud	83,073.5	4,676.2	470.2	4,205.9	470.2	0.0
A2.4 - Littoral mixed sediments	10,871.6	3,588.8	1,326.1	2,262.7	1,326.1	0.0
A2.5 - Coastal saltmarshes and saline reedbeds	18,088.7	3,108.2	1,005.4	2,102.8	1,005.4	0.0
A2.6 - Littoral sediments dominated by aquatic angiosperms	2,013.4	0.0	0.0	0.0	0.0	0.0
A2.7 - Littoral biogenic reefs	4,513.0	0.0	0.0	0.0	0.0	0.0
A3.1 - Atlantic and Mediterranean high energy infralittoral rock	162,651.3	1,009.3	739.8	269.6	739.8	0.0
A3.2 - Atlantic and Mediterranean moderate energy infralittoral rock	101,398.6	2,712.4	1,970.7	741.7	1,970.7	0.0
A3.3 - Atlantic and Mediterranean low energy infralittoral rock	49,085.7	1,024.6	898.2	126.3	898.2	0.0
A4.1 - Atlantic and Mediterranean high energy circalittoral rock	678,527.2	3,311.8	2,002.3	1,309.5	2,002.3	0.0
A4.2 - Atlantic and Mediterranean moderate energy circalittoral rock	662,104.8	19,632.7	14,929.6	4,703.1	14,929.6	0.0
A4.3 - Atlantic and Mediterranean low energy circalittoral rock	158,602.8	5,277.2	4,230.6	1,046.5	4,230.6	0.0
A5.1 - Sublittoral coarse sediment	16,004,205.6	199,947.3	65,063.9	134,883.4	65,063.9	0.0
A5.2 - Sublittoral sand	26,428,987.5	127,268.0	62,630.7	64,637.3	62,630.7	0.0
A5.3 - Sublittoral mud	6,534,079.8	237,833.3	81,463.3	156,370.0	81,463.3	0.0
A5.4 - Sublittoral mixed sediments	1,977,113.3	62,075.8	37,535.4	24,540.3	37,535.4	0.0
A5.5 - Sublittoral macrophyte-dominated sediment	19,195.6	1,283.6	909.4	374.2	909.4	0.0
A5.6 - Sublittoral biogenic reefs	51,092.2	75.0	75.0	0.0	75.0	0.0
A6.1 - Deep-sea rock and artificial hard substrata	681,771.9	0.0	0.0	0.0	0.0	0.0
A6.2 - Deep-sea mixed substrata	5,322,777.0	0.0	0.0	0.0	0.0	0.0
A6.3 - Deep-sea sand	6,463,493.1	0.0	0.0	0.0	0.0	0.0
A6.4 - Deep-sea muddy sand	3,569,707.0	0.0	0.0	0.0	0.0	0.0
A6.5 - Deep-sea mud	20,078,300.6	0.0	0.0	0.0	0.0	0.0
A6.6 - Deep-sea bioherms	2,270.5	0.0	0.0	0.0	0.0	0.0
Σ Area (Ha)	89,257,310.4	680,376.0	276,628.5	403,747.4	276,628.4	-

BEACH Inputs 3: MPA network site management

The figure below shows the slider bar that is used to allow the user to provide a first approximation of the balance of management for any MPAs that are embedded within the BBT, identifying the proportion of the overall MPA area that is managed to a 'maintain' conservation objective, and the proportion managed to a 'recover' conservation objective. As the percentage balance between the two alternative management options is adjusted on the slider bar – between 100% maintain and 100% recover - the area values presented in the two columns below the slider will be automatically updated. As a first approximation, this percentage split is assumed to affect each habitat type within the MPA network equally and is NOT meant to represent a site-specific allocation between the two management options.

If they are present within the BBT, how are any MPAs embedded within the BBT protected/managed? In general terms, approximately what % of the overall MPA area is managed to a 'Maintain' conservation objective, and what % to a 'Recover' objective?

MAINTAIN mgmnt (100%)	<input type="range"/>	RECOVER mgmnt (0%)
--------------------------	-----------------------	-----------------------

4: BEACH Summary outputs

In addition to the data entry fields and controls, the main worksheet tab ('Controls & Inputs') also provides a high-level summary of the tool's outputs (see figure below).

HIGH LEVEL OUTPUT SUMMARY VALUES (€m)		
	2019 value	NPV (20 yr)
National waters	€ 8,891.34	- not applicable -
Undesignated regional (BBT) waters	€ 40.73	€ 556.59
MPAs within BBT - MAINTAIN mgmnt (60%)	€ 16.72	€ 241.72
MPAs within BBT - RECOVER mgmnt (40%)	€ 11.14	€ 210.25
BBT total (= un-designated + included MPAs)	€ 68.59	€ 1,008.55

The detailed outputs that underpin the summary figures are presented on the [blue](#) 'Detailed outputs' worksheet tab (see figure below).

Note that, for the detailed outputs, the colour-coding that is applied to cell shading follows the conventions adopted elsewhere in the BEACH tool. Cells holding information (inputs or outputs) that relate to the national scale are shaded blue, whilst those that relate to the regional (BBT) scale are shaded green. Information relating to any MPAs embedded within the BBT is presented in red-shaded cells. Finally, BBT total figures are shown in yellow-shaded cells.

BEACH Detailed outputs

The upper blocks of values present the outputs broken down by habitat, whilst the lower blocks are broken down by benefit type. At the same time, the left-hand blocks present outputs as annualised (2019 equivalent) values, whilst the right-hand blocks present the outputs as the 20-year Net Present Value estimates.

In all instances, values are presented as millions of Euros (€m).

Est. annualised (2019) value of societal benefits: €m accruing - by habitat					EUNIS habitat type	Est. (20 yr discounted) Net Present Value of societal benefits: €m				
National waters	Undesignated regional (BBT) waters	MPAs within BBT - MAINTAIN mgmnt (60%)	MPAs within BBT - RECOVER mgmnt (40%)	BBT total (= un-designated plus included MPAs)		Undesignated regional (BBT) waters	MPAs within BBT - MAINTAIN mgmnt (60%)	MPAs within BBT - RECOVER mgmnt (40%)	BBT total (= un-designated plus included MPAs)	
0.40	0.02	0.00	0.00	0.03	A1.1 - High energy littoral rock	0.23	0.22	-	0.46	
0.56	0.03	0.02	0.01	0.05	A1.2 - Moderate energy littoral rock	0.29	0.27	-	0.55	
0.86	0.05	0.02	0.01	0.08	A1.3 - Low energy littoral rock	0.02	0.02	-	0.03	
0.93	0.00	0.00	0.00	0.01	A2.1 - Littoral coarse sediment	0.60	0.48	-	1.08	
21.09	0.64	0.04	0.03	0.71	A2.2 - Littoral sand and muddy sand	0.46	0.35	-	0.80	
9.28	0.47	0.03	0.02	0.52	A2.3 - Littoral mud	1.54	1.36	-	2.90	
1.46	0.30	0.11	0.07	0.48	A2.4 - Littoral mixed sediments	1.54	1.51	-	3.04	
3.18	0.37	0.11	0.07	0.55	A2.5 - Coastal saltmarshes and saline reedbeds	-	-	-	-	
0.31	-	-	-	-	A2.6 - Littoral sediments dominated by aquatic angiosperms	-	-	-	-	
0.51	-	-	-	-	A2.7 - Littoral biogenic reefs	0.66	0.63	-	1.29	
16.76	0.03	0.05	0.03	0.10	A3.1 - Atlantic and Mediterranean high energy infralittoral rock	1.76	1.67	-	3.43	
10.45	0.08	0.12	0.08	0.28	A3.2 - Atlantic and Mediterranean moderate energy infralittoral rock	0.80	0.76	-	1.56	
5.06	0.01	0.06	0.04	0.11	A3.3 - Atlantic and Mediterranean low energy infralittoral rock	1.79	1.59	-	3.38	
69.79	0.13	0.12	0.08	0.34	A4.1 - Atlantic and Mediterranean high energy circalittoral rock	13.32	11.88	-	25.21	
68.10	0.48	0.92	0.61	2.02	A4.2 - Atlantic and Mediterranean moderate energy circalittoral rock	3.78	3.37	-	7.14	
16.31	0.11	0.26	0.17	0.54	A4.3 - Atlantic and Mediterranean low energy circalittoral rock	49.06	36.56	-	85.62	
1,390.80	11.72	3.39	2.26	17.38	A5.1 - Sublittoral coarse sediment	56.90	51.25	-	108.15	
2,767.12	6.77	3.93	2.62	13.32	A5.2 - Sublittoral sand	77.77	70.59	-	148.36	
718.92	17.20	5.38	3.59	26.17	A5.3 - Sublittoral mud	30.04	26.61	-	56.65	
182.35	2.26	2.08	1.38	5.73	A5.4 - Sublittoral mixed sediments	1.04	1.00	-	2.04	
2.52	0.05	0.07	0.05	0.17	A5.5 - Sublittoral macrophyte-dominated sediment	0.07	0.06	-	0.13	
5.44	-	0.00	0.00	0.01	A5.6 - Sublittoral biogenic reefs	-	-	-	-	
56.78	-	-	-	-	A6.1 - Deep-sea rock and artificial hard substrata	-	-	-	-	
480.71	-	-	-	-	A6.2 - Deep-sea mixed substrata	-	-	-	-	
572.91	-	-	-	-	A6.3 - Deep-sea sand	-	-	-	-	
316.41	-	-	-	-	A6.4 - Deep-sea muddy sand	-	-	-	-	
2,172.14	-	-	-	-	A6.5 - Deep-sea mud	-	-	-	-	
0.20	-	-	-	-	A6.6 - Deep-sea bioherms	-	-	-	-	
8,891.34	40.73	16.72	11.14	68.59	Overall totals	241.65	210.19	-	451.84	

Est. annualised (2019) value of societal benefits: €m accruing - by benefit					Societal benefit	Est. (20 yr discounted) Net Present Value of societal benefits: €m				
National waters	Undesignated regional (BBT) waters	MPAs within BBT - MAINTAIN mgmnt (60%)	MPAs within BBT - RECOVER mgmnt (40%)	BBT total (= un-designated plus included MPAs)		Undesignated regional (BBT) waters	MPAs within BBT - MAINTAIN mgmnt (60%)	MPAs within BBT - RECOVER mgmnt (40%)	BBT total (= un-designated plus included MPAs)	
283.88	1.41	0.60	0.40	2.41	Food (wild, farmed)	18.71	8.66	-	27.37	
-	-	-	-	-	Fish feed (wild, farmed, bait)	-	-	-	-	
-	-	-	-	-	Fertiliser and biofuels	-	-	-	-	
-	-	-	-	-	Ornaments and aquaria	-	-	-	-	
-	-	-	-	-	Medicines and blue biotechnology	-	-	-	-	
2,489.44	11.06	4.44	2.96	18.47	Prevention of coastal erosion	151.23	64.25	64.57	280.05	
-	-	-	-	-	Sea defence	1.01	0.42	0.28	1.71	
9.05	0.07	0.03	0.02	0.12	Waste burial / removal / neutralisation	41.88	16.98	17.04	75.90	
683.33	3.06	1.17	0.78	5.02	Tourism and nature watching	115.52	50.53	37.31	203.36	
1,725.74	8.14	3.49	2.33	13.96	Spiritual and cultural well-being	-	-	-	-	
-	-	-	-	-	Aesthetic benefits	10.33	4.11	2.75	17.20	
101.06	0.72	0.28	0.19	1.19	Education and Research	163.47	74.37	73.28	311.12	
2,765.64	12.51	5.14	3.43	21.08	Combined health benefits (phys AND psych)	54.44	22.41	15.01	91.86	
833.20	3.77	1.55	1.03	6.35	Physical health benefits	-	-	-	-	
-	-	-	-	-	Psychological health benefits	-	-	-	-	
-	-	-	-	-	Overall totals	556.59	241.72	210.25	1,008.55	
8,891.34	40.73	16.72	11.14	68.59						

Detailed breakdown of NPV outputs

Finally, the [blue](#) 'Output matrices' tab presents the estimated NPV values, broken down by both habitat type and benefit stream, in a single matrix (see figure below).

The geographic scope of the information presented is controlled by the selection made by the user from the drop-down list in the green box in the top-left of the worksheet (see figure below). Click on the green box and select the required scope from the drop-down list that appears

The user is able to select one of six options, presenting the detailed output breakdowns for:

- ★ Current value (2019 equivalent): Undesignated regional marine waters
- ★ Current value (2019 equivalent): MPAs within BBT
- ★ Current value (2019 equivalent): BBT overall
- ★ Net Present Value: Undesignated regional marine waters
- ★ Net Present Value: MPAs within BBT
- ★ Net Present Value: BBT overall

Show outputs for: **Current value (2019 equivalent): BBT overall**

Current value (2019 equivalent): BBT overall (all figures as € millions)			Societal Benefit														Totals
			1 Food provision	2 Fish feed	3 Fertiliser and biofuels	4 Ornaments and aquaria	5 Medicines and blue biotechnology	6 Healthy climate	7 Prevention of coastal erosion	8 Sea defence	9 Waste burial /removal/ neutralisation	10 Tourism and nature watching	11 Spiritual and cultural wellbeing	12 Aesthetic Benefits	13 Education, Research	14 Human Health Benefits	
EUNIS (level 3) Habitat Class	A1.1	High energy littoral rock	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.03
	A1.2	Moderate energy littoral rock	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.01	0.05
	A1.3	Low energy littoral rock	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.03	0.01	0.08
	A2.1	Littoral coarse sediment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	A2.2	Littoral sand and muddy sand	0.02	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.03	0.31	0.00	0.03	0.17	0.05	0.71
	A2.3	Littoral mud	0.02	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.05	0.09	0.00	0.02	0.14	0.04	0.52
	A2.4	Littoral mixed sediments	0.01	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.04	0.20	0.00	0.02	0.11	0.03	0.48
	A2.5	Coastal saltmarshes and saline reedbeds	0.02	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.05	0.18	0.00	0.02	0.10	0.03	0.55
	A2.6	Littoral sediments dominated by aquatic angiosperms	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A2.7	Littoral biogenic reefs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A3.1	Atlantic and Mediterranean high energy infralittoral rock	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.00	0.00	0.03	0.01	0.10
	A3.2	Atlantic and Mediterranean moderate energy infralittoral rock	0.01	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.10	0.00	0.00	0.08	0.03	0.28
	A3.3	Atlantic and Mediterranean low energy infralittoral rock	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.00	0.00	0.03	0.01	0.11
	A4.1	Atlantic and Mediterranean high energy circalittoral rock	0.02	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.13	0.00	0.01	0.10	0.03	0.34
	A4.2	Atlantic and Mediterranean moderate energy circalittoral rock	0.10	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.75	0.00	0.03	0.61	0.18	2.02
	A4.3	Atlantic and Mediterranean low energy circalittoral rock	0.03	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.20	0.00	0.01	0.16	0.05	0.54
	A5.1	Sublittoral coarse sediment	0.69	0.00	0.00	0.00	0.00	3.45	0.00	0.03	1.03	3.77	0.00	0.33	6.20	1.87	17.38
	A5.2	Sublittoral sand	0.44	0.00	0.00	0.00	0.00	4.46	0.00	0.02	0.66	2.40	0.00	0.21	3.94	1.19	13.32
	A5.3	Sublittoral mud	0.82	0.00	0.00	0.00	0.00	8.34	0.00	0.04	2.50	4.48	0.00	0.40	7.37	2.22	26.17
	A5.4	Sublittoral mixed sediments	0.21	0.00	0.00	0.00	0.00	1.07	0.00	0.01	0.65	1.17	0.00	0.10	1.92	0.58	5.73
	A5.5	Sublittoral macrophyte-dominated sediment	0.01	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.00	0.00	0.04	0.01	0.17
	A5.6	Sublittoral biogenic reefs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	A6.1	Deep-sea rock and artificial hard substrata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A6.2	Deep-sea mixed substrata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A6.3	Deep-sea sand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A6.4	Deep-sea muddy sand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A6.5	Deep-sea mud	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	A6.6	Deep-sea bioherms	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals			2.41	0.00	0.00	0.00	0.00	18.47	0.00	0.12	5.02	13.96	0.00	1.19	21.08	6.35	68.59