Offshore Wind Evidence + Change Programme

Delivery Options for Strategic Marine Net Gain

Analysis of Existing Recovery and Restoration Projects and Proposals

THE CROWN ESTATE

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Executive Summary

The Task and Finish (T&F) Group, funded by the Offshore Wind Evidence and Change Programme, completed its first report in October 2021, setting out a number of strategic targets for marine and intertidal net gain. These targets were widely consulted on, and well supported by a range of marine stakeholders. Building on the outcomes from the first phase of work, the T&F Group is working to develop potential delivery options for strategic MNG, with the aim of identifying and agreeing recommendations for more local delivery of strategic net gain targets.

The first task has been to undertake an analysis of existing recovery and restoration projects and proposals (including pressure removal/reduction projects) at a national and local level, with consideration of local and regional priorities and drivers. The outputs presented within this report provide a comprehensive review of existing initiatives, including innovative or inventive types of initiatives being undertaken which could be applied to MNG.

The review and the call for evidence identified 709 recovery and restoration projects. In total, restoration projects targeting 25 types of habitat and species feature were captured within the call for evidence.

The emphasis of the work was with consideration of MNG policy development in England. This resulted in an underrepresentation of projects within the devolved administrations. This is acknowledged as a limitation within this report, but as such it is recommended that future work build on the exiting database and develop a wider understanding of interventions being undertaken within the devolved administrations, to expand on existing knowledge of restoration, creation and enhancement techniques, and identify innovative methods that could also be applied to MNG.

Next steps will involve agreeing a suitable basis for determining potential demands for net gain projects regionally. Alongside this, future work will also need to consider what is needed ecologically within each marine plan region to facilitate a strategic approach to restoration. Linking of current and future restoration interventions against existing initiatives, such as Shoreline Management Plans, River Basin Management Plans and Local Nature Recovery Strategies which have a marine element will be key in order to achieve this.

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Document Control

Version	Author	Approved	Date	Description of change
1.0	Task and Finish Group	Task and Finish Group (Chair)	09/11/2023	Approved for issue by Task and Finish Group.

1. Introduction

There is increasing recognition of the need for greater action to restore our marine environment in the face of a continued decline in marine biodiversity. Net gain has been identified as a potentially important mechanism that can contribute to halting and reversing marine biodiversity loss. From autumn 2023, two years following royal ascent of the Environment Act, it will be mandatory for all in scope developments in the terrestrial and intertidal environment to deliver a minimum biodiversity net gain of 10%. Although there is no formal net gain policy as yet for the marine environment, Government has committed to developing such a policy, and has held a first consultation on the principles of marine net gain (MNG).

The Task and Finish (T&F) Group, funded by the Offshore Wind Evidence and Change Programme, completed its first report in October 2021, setting out a number of strategic targets for marine and intertidal net gain. These targets were widely consulted on, and well supported by a range of marine stakeholders. In addition, the T&F Group set out a number of assumptions and recommendations for further consideration in the development of a policy for MNG (The Crown Estate, 2021[1]).

Building on the outcomes from the first phase of work, the T&F Group is now working to develop potential delivery options for strategic MNG. The aim of this project is to identify and agree recommendations for a more local delivery of strategic net gain targets for the improvement and recovery/restoration of marine and intertidal environments, which can be used as a basis for determining net gain targets for marine industry sectors, including offshore wind. ABPmer has been commissioned to support the work of the T&F Group.

The first task has been to undertake an analysis of existing recovery and restoration projects and proposals (including pressure removal/reduction projects) at a national and local level, with consideration of local and regional priorities and drivers. The outputs seek to identify the scale of future development activity at a regional (marine plan area) level and combine information on potential project impacts and future project development to establish a potential level of demand for MNG at regional level.

2. Review of existing recovery and restoration projects

An extensive review of existing recovery and restoration projects and proposals (including pressure removal/reduction projects) was undertaken to capture both national and local level projects. The review encompassed projects being undertaken across the UK, not just within England, to ensure a comprehensive review of existing initiatives which could be applied to MNG, including innovative or inventive types of initiatives being undertaken within devolved administrations, not captured within England, which could be applied to MNG.

Relevant projects identified as part to the review were collated in a standardised manner within a searchable Excel database (Appendix B). As well as specific recovery and restoration projects/proposals the review also collated information on existing policy-led development initiatives. Information recorded for each project/ initiative, where available, included:

[1] The Crown Estate. 2021. Strategic Net Gain Task and Finish Group, Offshore Wind Evidence and Change Programme, Strategic Net Gain Targets for Coastal and Marine Environments. Online. Available here: https://www.marinedataexchange.co.uk/details/3513/2021-strategic-net-gain-task-and-finish-group-offshore-wind-evidence-and-change-programme-strategic-net-gain-targets-for-coastal-and-marine-environments/summary

- Project name
- Project description
- Location
- Site coordinates
- Site area (ha)
- Project type (Creation; Restoration; Enhancement; Pressure removal)
- Project status (Planned; Underway; Complete)
- Project start date
- Project end date (if applicable)
- Target marine features
- Key drivers (Project mitigation/compensation; Management authority actions within MPAs; Management authority actions outside of MPAs; Voluntary initiative; Research; Other (please specify))
- Links to regional/local priorities
- Lead organisation (overall project lead)
- Delivery organisation(s)
- Funding partner(s)
- Total project cost (or predicted cost)
- Delivery cost
- Monitoring and maintenance costs
- Project outcomes (or expected outcomes)
- Monitoring and evaluation
- Criteria used to measure success
- Source
- Additional information

Sources of information collated on each project were also recorded as well as any supplementary information. The list of projects included in this review is not exhaustive and it is acknowledged that there are likely others in various development stages or planned that potentially were not captured as part of this study.

2.1 Call for evidence

To help supplement the initial review, a call for evidence was launched on 28 February 2023. This was publicised at Coastal Futures, through CMS news and via LinkedIn, and ran for three weeks. The call for evidence was hosted using SurveyMonkey and required respondents to provide the above listed data through a link to the evidence database.

Respondents were also invited to complete a brief questionnaire aiming to gain a broader view on potential delivery options for strategic marine and intertidal net gain. The questionnaire also contained the following five questions:

- Thinking about completed projects that you are familiar with, how successful was the evaluation process and what lessons were learnt as part of the evaluation?;
- What were the key challenges for project delivery and how were they overcome?;
- Can you suggest additional metrics/indicators not already being used which you consider would be useful to measure the success of intertidal and marine restoration/ recovery projects?;
- Strategic targets will need to consider appropriate spatial scales. Do you agree that marine plan level could be an appropriate scale for marine Net Gain?; and
- Would you be happy for the T&F Group to contact you further regarding the information you have provided?

3. Results

3.1 Existing recovery and restoration projects

The initial review and the call for evidence identified 709 restoration projects. Figure 1 shows the number of initiatives for the UK and for each devolved administration.

Of the 709 projects identified, 674 were being, or had been, undertaken within England. The database therefore underrepresents measures outside of England with very few initiatives being recorded from Northern Ireland, Scotland or Wales and only single projects identified from the Channel Islands and the Isle of Man. It is acknowledged that the emphasis of this work is with consideration of MNG, which is an English policy, and has led to underrepresentation within the devolved administrations. As a result, comparative analysis has focused only on projects identified within England and has not been undertaken between countries, and no comparison can be made using the data collected from respondents. However, the importance of cross-boundary projects, especially in areas such as the Severn Estuary, Solway Firth and Dee Estuary is recognised.

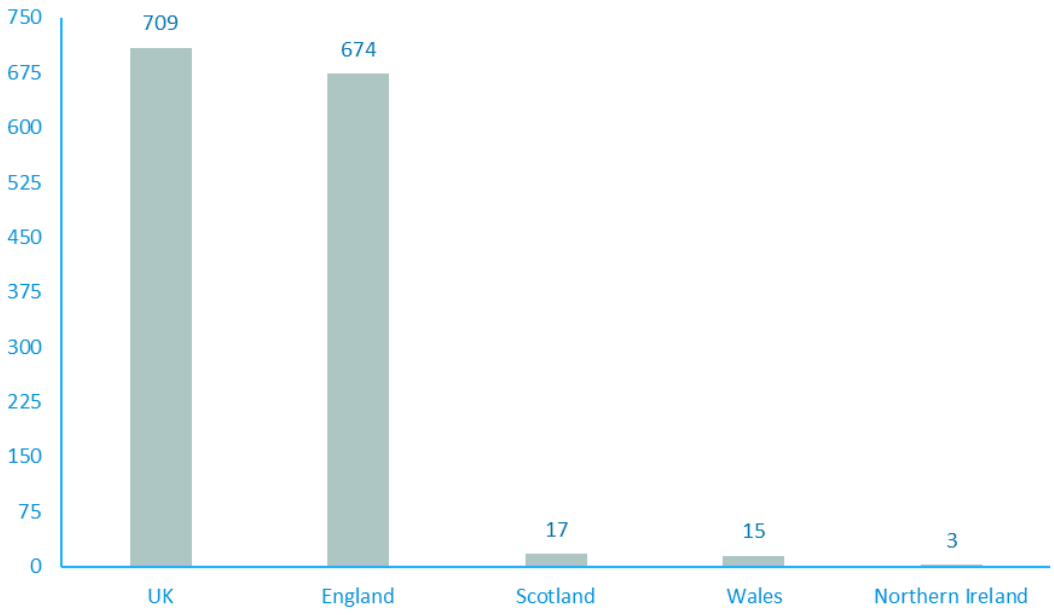


Figure 1. The number of restoration initiatives identified across the UK and devolved administrations

Five main drivers of relevant recovery, restoration and pressure reduction/ removal projects were identified as part of the call to evidence and were predetermined for stakeholders to best assign to their project, namely:

- Actions taken by developers to offset impacts from development projects (including compensatory measures under Birds & Habitats Directives, Measures of Equivalent Environmental Benefit (MEEB) under Marine and Coastal Access Act 2009 (MCAA) or voluntary measures taken by developers to address stakeholder objections or deliver company sustainability commitments);
- Actions determined by management authorities (e.g., Defra, Marine Management Organisation (MMO), Statutory Nature Conservation Bodies (SNCBs), Environment Agency (EA), harbour authorities with conservation remit) to support achievement of conservation objectives within MPAs;
- Actions determined by management authorities to support achievement of conservation goals outside of MPAs (e.g., Sussex Kelp Restoration Project; Restoring Meadow, Marsh and Reef (ReMeMaRe), Unlocking the Severn);
- Voluntary actions by Non-Governmental Organisations (NGOs), industry and local communities to restore and recover the marine environment (e.g., Project Seagrass, Solent Oyster Restoration Project);
- Socio-economic; and
- Research projects (e.g., ReMEDIES, Milford Haven Native Oyster Project, Stronger Shores (Flood and Coastal Resilience Innovation Programme).

Table 1 shows the number of projects identified for each of the key project drivers listed above. Stakeholders were also given the opportunity to select 'Other' and specify their project driver. In all such cases (12 projects) the driver for the project was given as 'socio-economic' such as enhancing or restoring habitats to support local tourism or fisheries. The predominant driver for relevant interventions were management authority actions associated with MPAs, all of which were related to pressure reduction measures. Voluntary initiatives were the second highest project driver. In most cases these were related to the restoration or creation of saltmarsh, seagrass or native oysters.

Table 1. Number of projects identified for each key project driver

Project driver	Number of projects
Project mitigation/ compensation	21
Management authority action within MPAs	471
Management authority action outside MPAs	46
Voluntary action	61
Research	33
Other - Socio-economic	12
Unspecified	65

In total, restoration projects targeting 25 types of habitat and species feature were captured within the call for evidence. These are listed in Table 2. Figure 2 shows the number of initiatives and the target habitat and species features for England, noting that some projects targeted more than one habitat or species feature. Due to the number of target features identified an 'Other category' was created to facilitate mapping.

This category is formed of:

- Artificial reef
- Artificial pools
- Kelp
- Subtidal mud
- Subtidal rock
- Supralittoral sand
- Reedbed
- Sand dunes
- Submarine structures made by leaking gases
- Transitional grassland
- Vegetated shingle

Subsequently, to assess the spatial distribution of existing restoration initiatives each project was mapped against each marine plan region. Figure 3 shows the spatial distribution of each target marine feature by marine plan region.

Table 2. Types of habitat and species features targeted by restoration initiatives

Habitat and species features		
Artificial pools	Reedbed	Subtidal mud
Artificial reef	Reef	Subtidal rock
Kelp	Saltmarsh	Subtidal sand
Lagoon	Sand dunes	Supralittoral sand
Marine fish	Sea caves	Transitional grassland
Marine mammals	Seabirds	Vegetated shingle
Migratory fish	Seagrass	Submarine structures made by leaking gases
Mudflat	Shellfish	
Native oyster	Subtidal gravel	

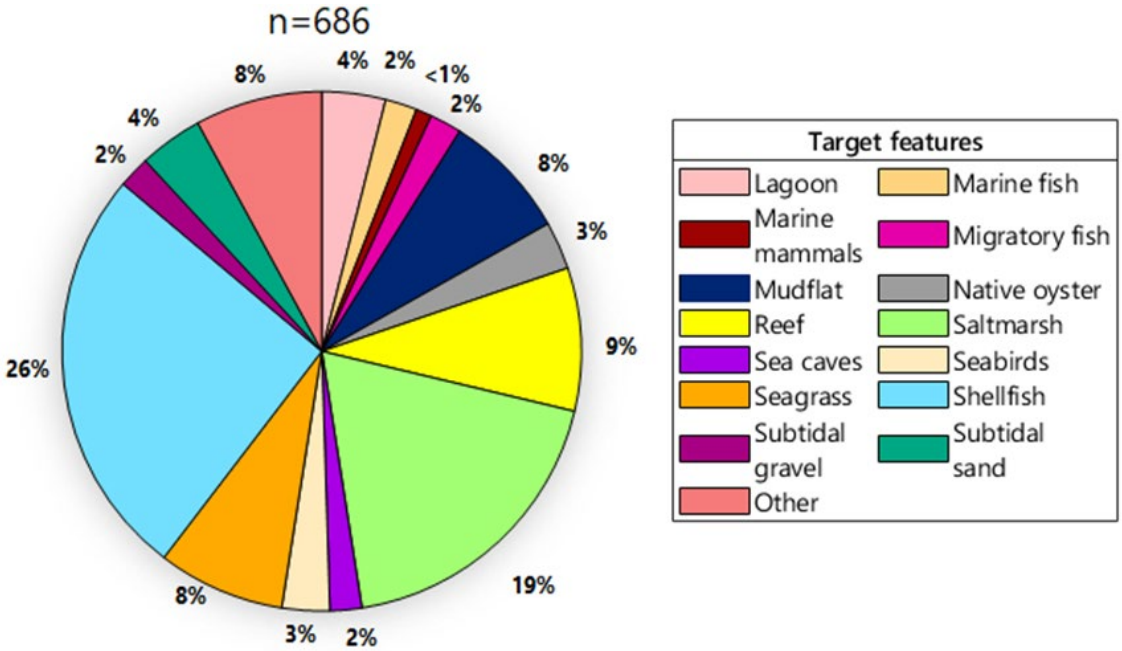


Figure 2. Summary of project target features for English interventions

Overall, measures which targeted shellfish[2] had the highest number of initiatives across the UK (Figure 2), generally linked to protected areas and pressure reduction measures, in particular in the East and North West marine plan regions (Figure 3.). Saltmarsh was the second highest target feature across the England. Initiatives to restore or enhance saltmarsh occurred within most marine plan regions but most frequently within the South and South East regions.

[2] Pressure reduction interventions generally related to MPA measures in England or to measures delivered via a statutory mechanism e.g., fisheries byelaws (MMO, Inshore Fisheries Conservation Authority (IFCA)).

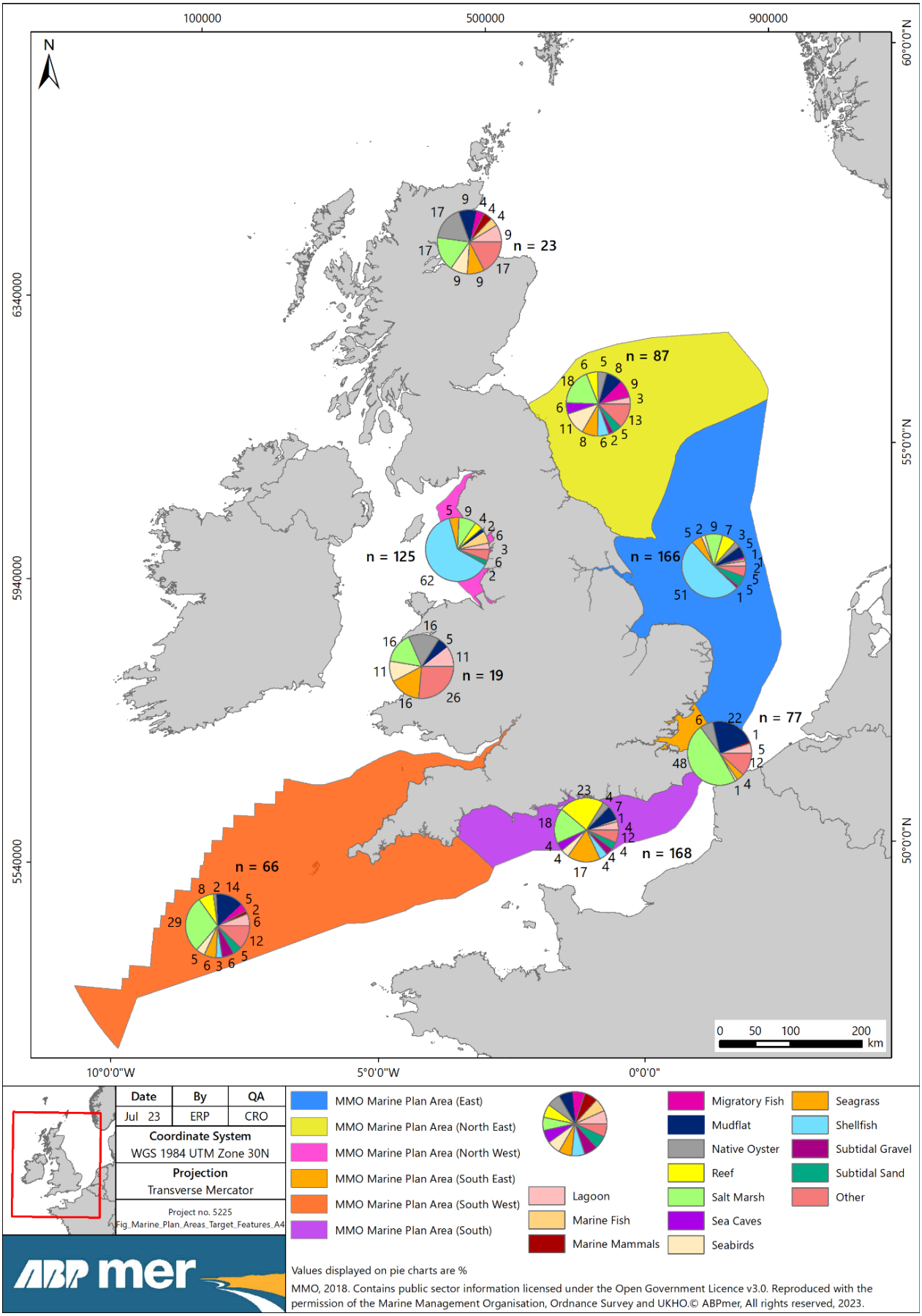


Figure 3. Target habitat or species for restoration and recovery projects by marine plan region

There were few projects identified targeting species such as marine mammals or migratory fish. The majority of projects targeting marine or migratory fish species were management authority actions. However, some voluntary initiatives were identified including the Sturgeon habitat restoration project, the River Trent and the Avon Severn eel pass projects, and the Culter dam fish pass that aims to aid the migration of salmon and sea trout. It is recognised that there are many additional projects and measures for migratory fish in rivers (e.g., installation of fish passes, gravel cleaning etc) but these have not been included in the database as they are beyond the geographical scope of our study.

Of the six projects focused on marine mammals, four were associated with management authority actions within MPAs. However, two research related projects were identified, namely the Greater Thames Seal Working Group and the Scottish Marine Animal Stranding Scheme.

The East marine plan region recorded the highest number of all types of restoration interventions, with the South the second highest (Figure 4). Very few projects were recorded from the Channel Islands, Isle of Man, Northern Ireland, Scotland or Wales for the reasons discussed above.

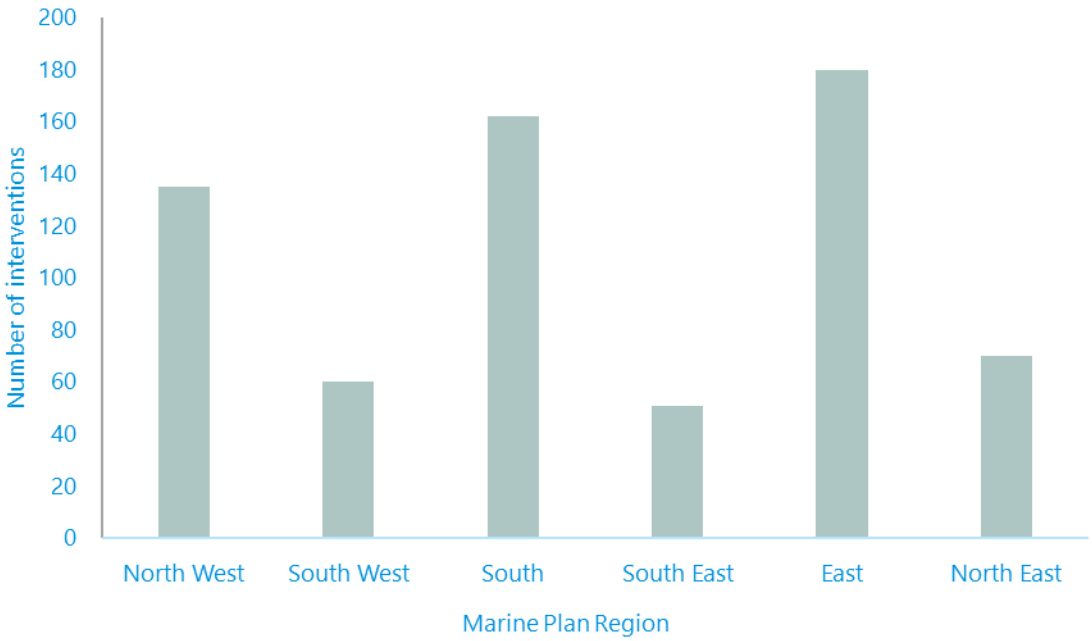


Figure 4. Number of interventions by marine plan region

Four key types of intervention were identified: creation, restoration, enhancement of habitats and/or species, or pressure reduction initiatives. To assess the spatial extent of existing restoration projects the distribution of each type of initiative was mapped against each marine plan region (Figure 5).

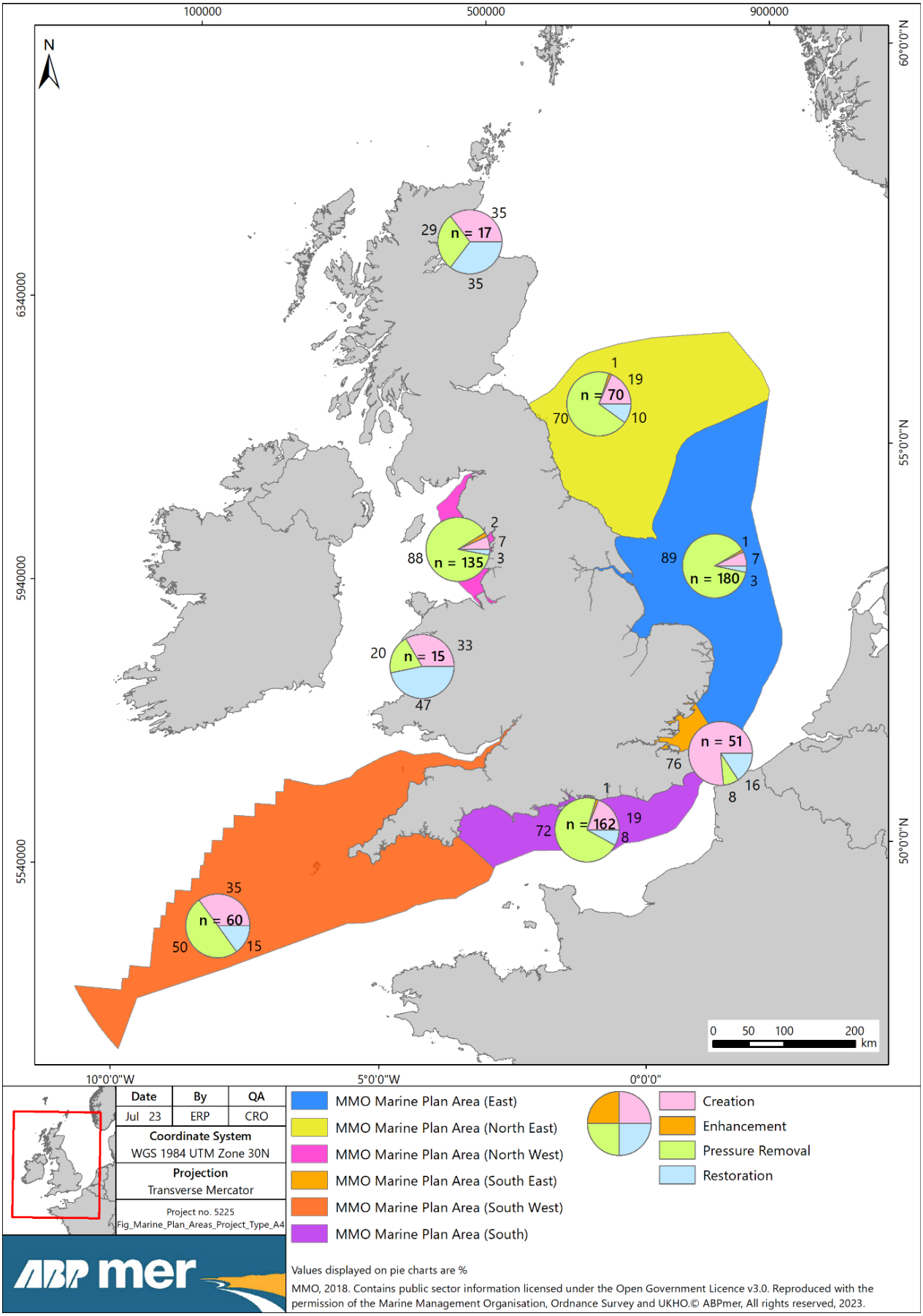


Figure 5. Project type by marine plan region

Seventy percent of all interventions identified were pressure removal projects. These pressure reduction interventions generally related to MPA measures in England or to measures delivered via a statutory mechanism (MMO, IFCAs). Similar data for Wales and Scotland was not captured in the database, due to the English remit of MNG policy.

The majority of pressure removal projects were associated with measures to protect shellfish stocks (i.e., IFCA fishing byelaws). There were few projects specifically targeting pressure reduction interventions on subtidal features, such as subtidal sand, gravel and mud, however it is acknowledged that any pressure reduction measures to protect shellfish stock will by default also provide protection for habitats in associated areas, by reducing bottom pressure. As a result, an assessment was undertaken to overlay areas subject to fisheries or MPA measures with EUNIS level 3 habitat classifications to assess the areas of subtidal mud, subtidal sand and subtidal gravel which receive de facto protection as a result of such pressure reduction measures. In total 15,034 km^2 of subtidal sediment benefit from pressure reduction as a result of fisheries or MPA measures, 87 % of which is located within the East marine plan region (Table 3). Subtidal sand receives the greatest protection by area across all marine plan regions, with subtidal mud the lowest, equating to 3.7 % of the total area.

Table 3. Area of subtidal mud, sand and gravel (km^2) covered by fisheries or MPA measures within each marine plan region

Marine plan region	Subtidal mud (A5.1)	Subtidal sand (A5.2)	Subtidal gravel (A5.1)	Total
South West	99	218	507	825
North West	356	8	0.5	364
North East	10	150	64	224
East	13	9,661	3,401	13,076
South East	52	55	36	143
South	26	112	265	402
Total	557	10,204	4,273	15,034

All MPA and IFCA byelaws to reduce pressure on shellfish are delivered via statutory mechanisms, therefore consideration was also given to identify the number of shellfish measures which were delivered under alternative drivers, for example voluntary measures. However, of the 177 identified shellfish projects only one was not associated with a management authority action, which was the North West Wildlife Trusts Cumbrian Creel Project[3], classified as a voluntary action undertaken by an NGO.

Other target features which were the focus of pressure removal activities included kelp, marine fish, marine mammals, migratory fish, mudflat, native oyster, reef, seabirds, seagrass, submarine structures made by leaking gases, subtidal habitats including gravel, mud, rock and sand and saltmarsh. Of those, listed reef features has the second highest number of pressure removal related projects, similarly these were all linked to management authority actions (Figure 6).

[3] North West Wildlife Trust Cumbrian Creel Project: https://www.livingseasnw.org.uk/what-we-do/marine-conservation-projects/creel-project

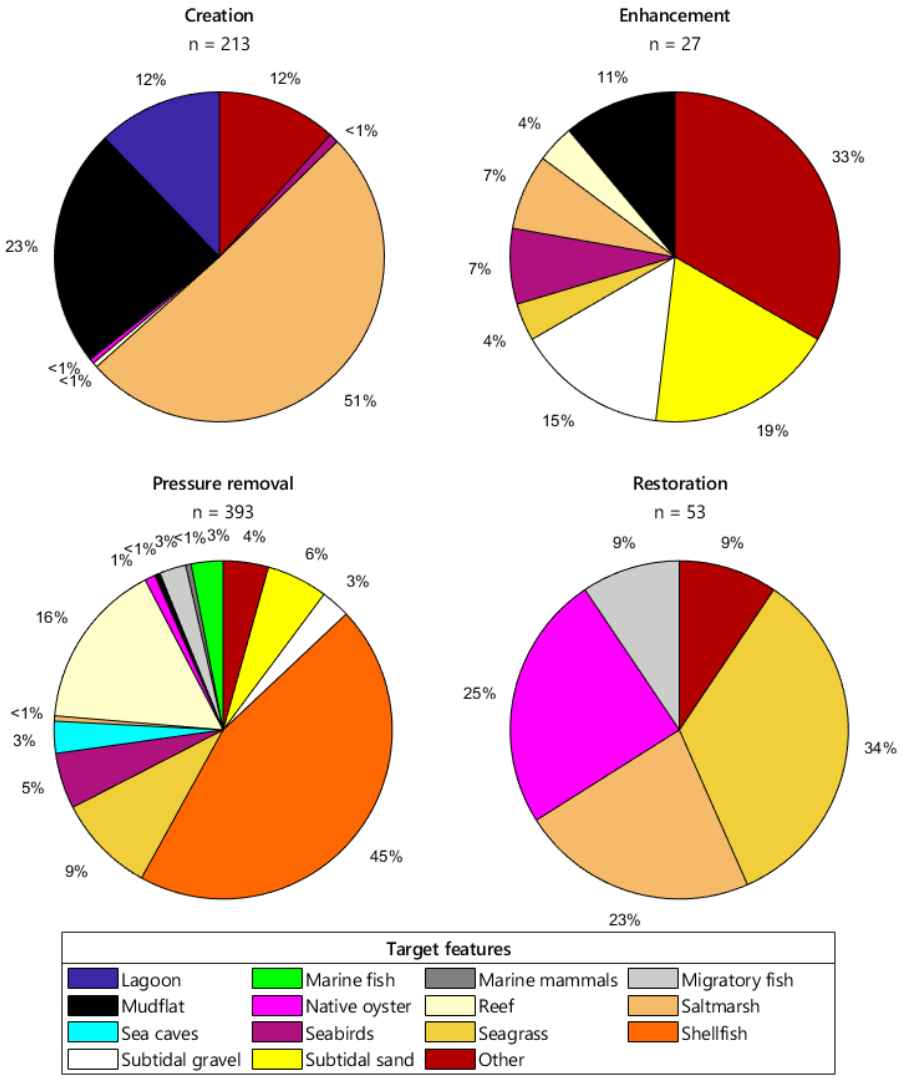
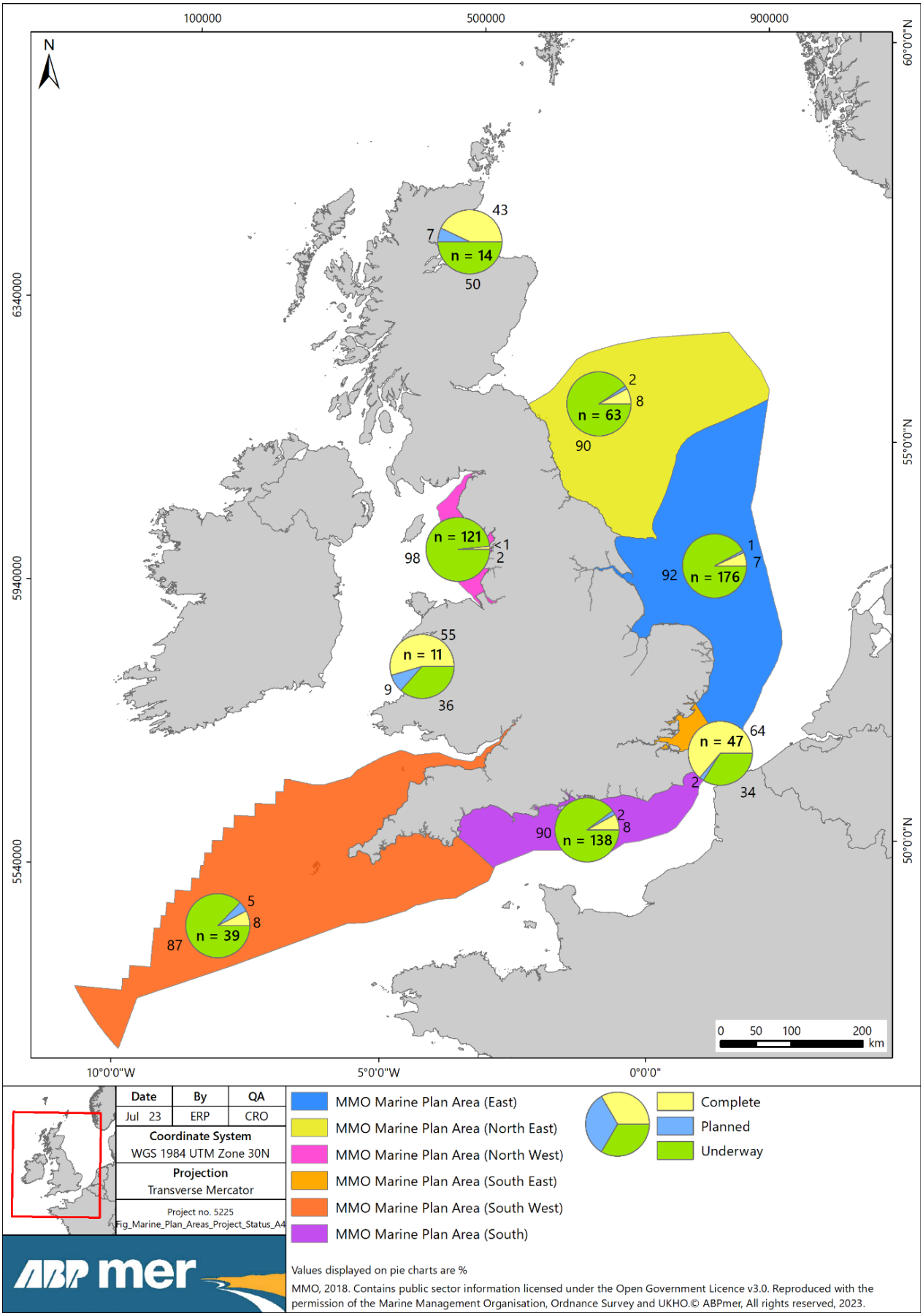


Figure 6. Target habitat or species features by project type

Of the remaining interventions, habitat creation projects accounted for 19 % of those identified, restoration 9 % and enhancement 2 %. The majority of habitat creation projects had been undertaken, or were underway, within the South East and South marine plan regions. Of the habitat creation projects identified, saltmarsh creation accounted for 51 % of interventions.

To assess the number of projects which have been undertaken to date and the potential supply of ongoing/ planned projects, the spatial distribution of restoration interventions by project status (completed, planned, underway) was mapped against each marine plan region (Figure 7).

Seventy-six of the 709 projects (11 %) had been completed at the time of the call for evidence (March 2023), the majority of which had been undertaken within the South East (40 %), East (16 %) and South (14%) marine plan regions. The majority of projects, 544 of the 709 (77 %), are currently underway, the highest number of which were within the North West marine plan region.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Complete
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Values displayed on pie charts are %
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Figure 7. Status (completed, underway or planned) of restoration and recovery projects by marine plan region

A large proportion of interventions underway are associated with management authority measures within MPAs (Table 4, Figure 8). Sixty-two projects are currently underway, excluding MPA management measures, for predominantly voluntary or research interventions. Only 13 planned, future, projects were identified during the call for evidence.

Table 4. Status of projects for each project driver

Main project driver	Completed	Underway	Planned	Unspecified
Management authority action within MPAs	1	470	0	0
Management authority action outside MPAs	34	2	4	6
Project mitigation/ compensation	16	2	2	1
Voluntary action	14	35	2	10
Research	5	21	5	2
Other - Socio-economic	6	2	0	4
Unspecified	-	-	-	*65*

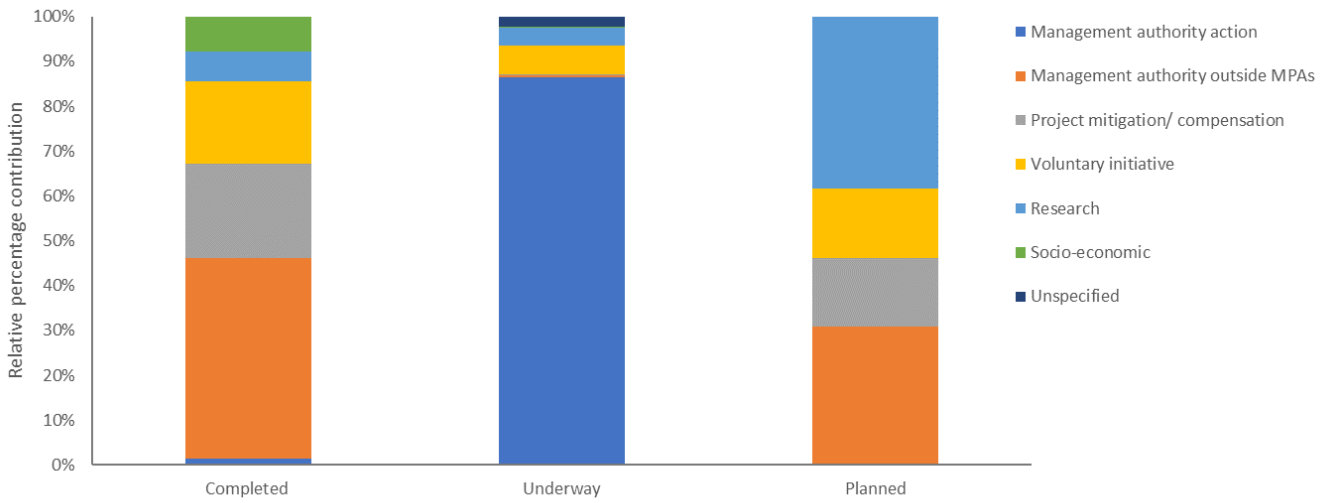

Figure 8. Relative percentage contribution of key project drivers to completed, underway or planned projects.

Table 5 provides a breakdown of the number of projects, completed, underway and planned, for each target habitat and species feature, noting that some projects target multiple features. A separate assessment was also considered which excluded MPA measures to assess the supply of habitat restoration interventions. For projects currently underway, excluding MPA measures, the three predominant target habitats were saltmarsh, seagrass and native oyster, which accounted for 68 % of interventions. Other target features included artificial pools, marine mammals, mudflat, sand dunes and seabirds, among others. Of the planned, future projects which have not yet started, the majority of projects (74 %) aim to target mudflat, saltmarsh and seabirds.

Table 5. Number of projects, completed, planned or underway, for each target feature

Row Labels	Completed	Underway	Underway (excluding MPA measures)	Planned	Unspecified
Artificial pools	3	4	4		
Artificial reef	3	1	1		1
Kelp		2	2	1	
Lagoon	18				12
Marine fish		12	1		1
Marine mammals		6	4		
Migratory fish	3	10		1	2
Mudflat	30	8	3	5	16
Native oyster	2	20	13	1	8
Reedbed	3				1
Reef		65			1
Saltmarsh	52	26	21	5	53
Sand dunes	4	3	3		
Sea caves		12			
Seabirds	1	23	4	4	4
Seagrass	1	54	14	1	8
Shellfish		175			1
Submarine structures made by leaking gases		1			
Subtidal gravel		15			
Subtidal mud		12			
Subtidal rock		7			
Subtidal sand		27			1
Supralittoral sand	3				
Transitional grassland	8	1			6
Vegetated shingle			1	1	
Total	**131**	**484**	**71**	**19**	**115**

Data on the spatial extent of habitat interventions is largely missing from the call for evidence data, however, data were provided for 138 projects which were either completed or underway, excluding MPA management projects, which were discussed separately above. A number of projects aimed to restore/ create multiple habitat or species features within the same site, where this was the case, it was assumed that the area of each habitat restored/ created was equal for the purposes of the assessment.

In total, 25,113 ha of habitat restoration/ creation/ pressure reduction were identified, the large majority of which, 20,400 ha, was associated with the Sussex Kelp Recovery Project, a marine rewilding project aiming to restore kelp forests through pressure reduction measures by introducing a new bylaw preventing trawling within 4 km of the coastline to allow natural regeneration (Table 6). The second largest project was the Alkborough managed realignment project, which created a total of 307 ha of saltmarsh, mudflat and reedbed habitat.

In terms of both the number of creation and/ or restoration projects, and the total area restored/ created, saltmarsh, mudflat and lagoon habitats were the highest targeted features. However, in terms of average area restored per project, sand dune and native oyster projects on average restored the largest areas of habitat, 79.7 ha and 74.2 ha respectively. Overall, on average, habitat creation/ restoration projects created/ restored 20.5 ha per project.

As a crude extrapolation, based on the identified planned projects this would equate to approximately 205 ha of habitat restoration/ creation across the 10 future habitat restoration/ creation projects planned to be undertaken within the East (2), North East (1), North West (1), South (3), South East (1), South West (2) marine plan regions. The remaining three planned projects are pressure removal projects that aim to reduce impacts to seabirds at a national level.

Table 6. Area of habitat and species features restored or created by intervention

	Number of projects	Total area (ha)	Average area (ha)
Pressure reduction			
Kelp	1	20,400.0	20,400.0
Marine fish	1	267.0	267.0
Sub-total	**2**	**20,667.0**	**10,333.5**
Creation/ restoration			
Artificial pools	4	3.7	0.9
Artificial reef	1	1.0	1.0
Lagoon	29	422.2	14.6
Mudflat	48	1,198.3	25.0
Native oyster	6	445.0	74.2
Reedbed	4	206.0	51.5
Saltmarsh	100	1,622.2	16.2
Sand dunes	4	318.7	79.7
Seagrass	5	44.5	8.9
Supralittoral sand	1	0.5	0.5
Transitional grassland	15	183.6	12.2
Sub-total	**217**	**4,445.7**	**20.5**
Total	**219**	**25,112.7**	**114.7**

3.2 Potential delivery options for strategic MNG

To help supplement the review, four key questions were posed to respondents aiming to gain a broader view on potential delivery options for strategic marine and intertidal Net Gain. The responses to each question are summarised below.

3.2.1 How successful was the evaluation process, and what lessons were learnt as part of the evaluation?

Respondents provided mixed responses to the question, with several noting that their projects had not had a set evaluation process but had used some arbitrary metrics to measure success, with another also highlighting that the evidence base for evaluation of success of marine restoration and recovery is still in its infancy. Despite this many agreed that an end of project evaluation process was key for future learning; for example, identifying not only successful outcomes but elements or techniques which had been unsuccessful to inform future restoration efforts and identify different monitoring strategies for future projects.

In addition to ecological data, such as change in habitat type/extent/ function, or species survival etc., some projects also considered additional evaluation measures including social and financial indicators.

One project noted that although they had a post-project evaluation process, the success of the evaluation and learnings from the project were limited by the lack of baseline data, i.e., an understanding of the changes resulting from the project. Appropriate baseline data are therefore required prior to project interventions and can also be useful to inform the types of metrics used to evaluate project outcomes.

A similar issue was highlighted by another respondent who suggested that current post-project monitoring does not assess the longer-term outcomes, but that this would be useful to track how the interventions develop over time and to ensure that interventions result in the intended net gain or project goal. They also noted that, where appropriate, comparisons of success across different types of marine restoration intervention would be valuable.

3.2.2 What were the key challenges for project delivery, and how were they overcome?

Marine licensing and insufficient funding were the two main challenges repeatedly noted by respondents, with 60 % of respondents citing challenges with obtaining licencing and 40 % referencing funding as a constraint.

Several respondents noted issues with obtaining the relevant licences to undertake their restoration interventions, largely due to the cost and complexity of the licencing and consent process. In several cases this resulted in project delays, impacts to budgets and in some cases prevented certain planned elements of the projects going ahead, one example of this related to the creation of fish refugia. These issues were particularly highlighted for projects being undertaken in privately owned areas, cross-boundary sites and designated sites. One respondent noted that the issues had been repeatedly raised with the relevant authorities, but no respondents noted how any issues had been resolved.

Funding was another issue noted as a key challenge, which had multiple project impacts. One respondent noted the limitation with longer-term funding to build resources to achieve long-term ambitions. This was similarly re-iterated by another that linked the lack of longer-term funding to capacity building to support ongoing restoration interventions. Furthermore, it was highlighted that funding was often linked to the project lifetime, which did not enable longer-term monitoring or evaluation of project success or allow for project outcomes to be shared more widely to support future restoration efforts.

Two additional challenges were also highlighted by respondents:

1. Demonstrating the project benefits/ outcomes due to a gap in robust baseline data; and
2. Building stakeholder interest and support in areas where there are conflicting interests over the use of space.

Few respondents identified how their issues had been overcome to enable project delivery, however one respondent suggested a number of options for overcoming challenges in the context of potential MNG projects in the future:

1. Funding secured under obligation of the developer to pay for habitat works in order to satisfy net gain conditions including monitoring to show the delivery of agreed gains.
2. Large scale developments creating potential for strategic, pooled funding for nature recovery, which could provide more scope for long-term funding security.
3. Using existing tools e.g., the Coastal Concordat to overcome licensing issues and to streamline the process. For example, the Coastal Concordat could help fast track or prioritise permissions to allow conservation work in the coastal and marine space.
4. Coordination between all the organisations involved and appointment of a coordination lead role in the early stages of project development.
5. Adding interim evaluation steps to demonstrate benefits at different stages throughout the project lifecycle, not just at the end, and using proxy indicators of success where necessary.
6. Development of working groups and engagement with other stakeholders at the earliest possible stage of any project to enable stakeholder buy in.

3.2.3 Can you suggest metrics or indicators not already being used which would be useful to measure the success of intertidal and marine restoration or recovery projects?

It was noted that the marine environment is inherently difficult to measure and therefore a novel approach to quantify MNG could be needed.

Multiple respondents noted the potential use of Natural Capital (NC) accounting/ assessment to help measure project success and assess the wider ecosystem service benefits provided by any interventions at a site, or for elements of the NC approach to be incorporated into a more specific MNG metric tool. It was suggested that such a tool could be used to assess the site baseline, undertake an anticipated benefits calculation and then a realised benefits account to measure the project success. However, it is noted that currently a lack of evidence may prevent the robust implementation of such an approach.

Additional suggested approaches to monitoring project success were inclusion of eDNA assessment to consider the wider ecosystem benefits provided by a site e.g., for managed realignment do the interventions at a site increase fish use? Or the use of Good Environmental Status as defined by the Marine Directive, for which there are eleven descriptors that describe what the environment will look like when GES has been achieved.

Several respondents also highlighted the need to utilise established methods and data to inform any MNG approach, e.g., through Environmental Impact Assessments (EIAs) to establish baselines where data is limited, and to consider measurements which acknowledge the interconnectivity of marine and coastal environments, for example, water quality measurements could be useful to explore wider ecosystem improvements created by projects.

One respondent in particular cautioned the application of the BNG metric for use in MNG, suggesting it was already challenging when applied in a coastal context.

Few species-specific approaches were suggested within the responses but one focusing on seal disturbance (including arising from climate change) suggested measures such as bycatch, entanglement, mortality, phenology shifts and noise impacts on hearing could be built into any assessment on impact.

3.2.4 Strategic targets will need to consider appropriate spatial scales. Do you think that marine plan level in England could be an appropriate scale for marine Net Gain?

Respondents were asked to select an option and provide a written justification of their response. Figure 9 shows the responses.

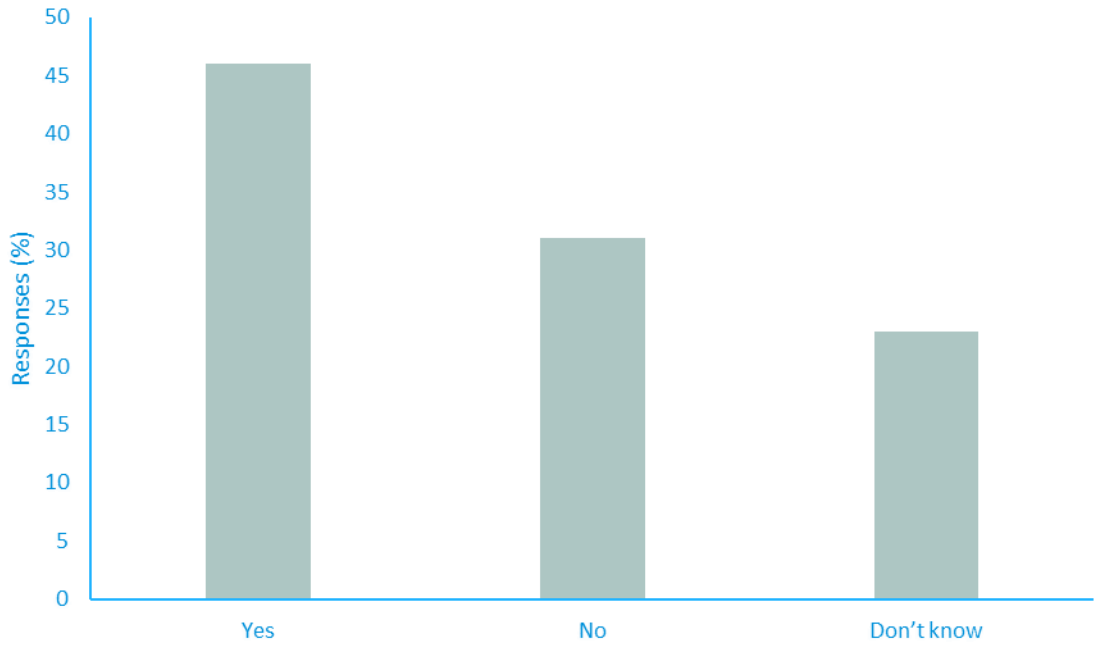

Figure 9. Stakeholder responses to the question: Do you think that marine plan level in England could be an appropriate scale for marine Net Gain?

Forty-six percent of responses agreed that marine plan level in England could be an appropriate scale for MNG; 31 % disagreed and 23 % were unsure.

For respondents that agreed, justification was given that marine plan regions provided a suitable starting point for MNG strategic targets but that such targets should also be governed by, and be relevant to, the ecology of the site to which any such gain is being applied. It was also raised that Offshore Wind Farm (OFW) developments tend to be grouped within marine plan regions e.g., Celtic Sea sites and those proposed for new floating OFW within the South West marine plan region. Strategic goals could therefore be tailored around developments happening within each marine plan region, and ensure MNG is being accounted for across all marine plan regions and across all developments within a region.

However, given the interconnectedness of the marine environment, it was suggested that a degree of flexibility may be required, especially for projects in close proximity to marine plan region boundaries e.g., an initiative just across a boundary may be more appropriate than one hundreds of miles away but still in the same marine plan area. In addition, it was noted that photo ID and satellite tagging demonstrate that highly mobile marine species use multiple marine plan regions, so whilst a marine plan region approach may be a good starting point, it will be necessary to bear in mind that some cross-boundary approaches may be required.

It was also highlighted that whilst proximity to the site of impact may be needed to ensure gains are delivered everywhere and not only in the most obvious locations, in some instances delivering gains for specifically impacted features or species may be more beneficial further afield, but that this should remain an exception.

Several respondents suggested the marine plan regions may be too large, covering huge geographic areas with a wide variety of habitats/species and different priorities for regions within those areas, and that it may be challenging to coordinate partners across the regions. It was suggested that spatial scales should be smaller and should look to collaborate with existing coastal partnerships to identify and fund priority actions. One respondent also suggested IFCA areas as an alternative and potentially more appropriate scale.

In contrast, some respondents suggested that MNG should consider all English regions and that England's marine ecosystems need to recover throughout its waters.

4. Conclusions and recommendations

The initial review and the call for evidence identified 709 projects of which 674 were being, or had been, undertaken within England.

The emphasis of the work was with consideration of MNG policy development in England. This resulted in an underrepresentation of projects within the devolved administrations. This is acknowledged as a limitation within this report, however, was not the focus of the call for evidence, and as a result, comparative analysis focused only on projects identified within England. It is, however, recommended that future work build on the exiting database and develop a wider understanding of interventions being undertaken within the devolved administrations, to expand on existing knowledge of restoration, creation and enhancement techniques, and identify innovative methods that could also be applied to MNG.

In total, restoration projects targeting 25 types of habitat and species feature were captured within the call for evidence. Overall, of the projects identified, 70 % were pressure removal projects, linked with management authority actions delivered via statutory mechanisms, which predominantly focused on targeting shellfish, particularly in the East and North West marine plan regions. These measures also protect the associated shellfish habitat. Of the remaining projects, habitat creation interventions accounted for 19 % of those identified, restoration 9 % and enhancement 2 %. Of the habitat creation projects, saltmarsh creation accounted for 51 %. Interventions to create or restore saltmarsh occurred within most marine plan regions but most frequently within the South and South East regions. There were few projects identified targeting species such as marine mammals and migratory fish and of those the majority of projects were management authority actions.

To assess the potential supply of ongoing/ planned projects the spatial distribution of restoration interventions by project status was mapped against each marine plan region. Seventy six of the 709 projects had been completed at the time of the call for evidence (March 2023), with the majority of projects, 544 of the 709, currently underway. However, a large proportion of interventions underway were associated with management authority measures within MPAs. Only 62 currently underway were not associated with MPA management measures and only 13 planned, future, projects were identified during the call for evidence.

For underway projects, excluding MPA measures, the three predominant target habitats were saltmarsh, seagrass and native oyster, which accounted for 68 % of interventions. Other target features included artificial pools, marine mammals, mudflat, sand dunes and seabirds. Of the planned, future projects which have not yet commenced, the majority of projects (74 %) aimed to target mudflat, saltmarsh and seabirds.

One limitation of the current data was that the spatial extent of habitat interventions was largely missing from the call for evidence data, as a result the analysis has focused on the number of projects identified per marine plan region. Future work to more accurately map the location and spatial extent of habitat interventions will be key in order to link ongoing and future restoration with areas of identified potential (such as those identified through ReMeMaRe) to provide a linkage to the benefits or infer where multiple benefits might occur.

For the 138 projects within the call for evidence where spatial extent data had been provided a total of 25,113 ha of habitat restoration/ creation/ pressure reduction had been undertaken. The large majority, 20,400 ha, was associated with the Sussex Kelp Recovery Project, aiming to restore kelp forests through pressure reduction measures. There were few projects specifically targeting pressure reduction interventions on subtidal features, however it is acknowledged that any pressure reduction measures, as a result of fisheries or MPA measures, will by default also provide protection for habitats in associated areas. In total 15,034 km^2 of subtidal sediment is subject to pressure reduction as a result of fisheries or MPA measures. Subtidal sand receives the greatest protection by area across all marine plan regions, with subtidal mud the lowest.

In terms of both the number of creation and/ or restoration projects, and the total area restored/ created, saltmarsh, mudflat and lagoon habitats were the highest targeted features. Overall, on average, habitat creation/ restoration projects created/ restored 20.5 ha per project. As a crude extrapolation, based on the identified

planned projects and the average per-project creation/ restoration footprint, currently there are approximately 205 ha of planned habitat restoration/ creation projects, to be undertaken within English waters.

Next steps will involve agreeing a suitable basis for determining potential demands for net gain projects regionally. Alongside this, future work will also need to consider what is needed ecologically within each marine plan region to facilitate a strategic approach to restoration. This was outside of the scope of the current work but could be an important focus for future work through the Offshore Wind Evidence and Change Programme, as this understanding will be needed to achieve nature recovery and as such is considered as an important next step. Within this process, the issue of additionality will need to be considered, identifying the demand and needs that link with current government initiatives and obligations. Marrying this anticipated demand with potential future supply will also need to be a key consideration. Linking of current and future restoration interventions against existing initiatives, such as Shoreline Management Plans, River Basin Management Plans and Local Nature Recovery Strategies which have a marine element will be key in order to achieve this.

The top two challenges to restoration interventions highlighted by respondents were obtaining licences to undertake their restoration interventions and insufficient funding for the duration of the projects, including funding to support long-term monitoring and evaluation of success.

It is recognised that these problems are more widespread and go beyond MNG projects and will therefore need potential government intervention to ensure environmental targets can be realised. However, a number of potential options for overcoming these challenges. in the context of potential future MNG projects, were identified including:

- Securing funding either under obligation of the developer to pay for habitat works in order to satisfy net gain conditions or through creation of a potential for strategic, pooled funding for nature recovery;
- Using existing tools e.g., the Coastal Concordat to overcome licencing issues and to streamline the process; and
- Coordination between all organisations involved and appointment of a coordination lead role in the early stages of project development.

Further work to review such options and to develop approaches to facilitate restoration interventions within the remit of MNG will be required.

Alongside all future work, more specific consideration will be needed to consider how, and to what extent, industry could feasibly contribute towards any identified targets through BNG and MNG.

5. Abbreviations/Acronyms

BNG	Biodiversity Net Gain
CMS	Communications and Management of Sustainability
Defra	Department for Environment, Food and Rural Affairs
EA	Environment Agency
eDNA	environmental Deoxyribonucleic Acid
EIA	Environmental Impact Assessment
EUNIS	European University Information Systems
GDPR	General Data Protection Regulation
GES	Good Environmental Status
ID	Identity
IFCA	Inshore Fisheries and Conservation Authorities
Linkedin	Business Social Networking Web Site
MCAA	Marine and Coastal Access Act 2009
MEEB	Measures of Equivalent Environmental Benefit
MMO	Marine Management Organisation
MNG	Marine Net Gain
MPA	Marine Protected Areas
NC	Natural Capital
NGO	Non-Governmental Organisation
OFW	Offshore Wind Farm
ReMEDIES	LIFE Recreation ReMEDIES
ReMeMaRe	REstore MEadows, MArshes and REefs
RSPB	Royal Society for the Protection of Birds
SNCBs	Statutory Nature Conservation Bodies
SUDG	Seabed User and Developer Group
T&F	Task and Finish
UK	United Kingdom

Appendices

Appendix A. Delivery options for strategic marine net gain: Call for evidence

Preface

Background

A Task and Finish Group has identified a number of strategic targets for marine Net Gain (MNG), that could be delivered by marine and coastal industries as part of the development process.
The Group comprises SUDG members, The Wildlife Trusts, RSPB, Natural England, The Crown Estate, Defra, supported by consultants ABPmer. It is made possible through funds provided by The Crown Estate via the Offshore Wind Evidence and Change Programme, a unique initiative that enables the gathering of data and evidence to support the sustainable development of offshore wind in the UK.

The primary aim of the work completed by the Group was to establish how net gain, and therefore funding from industry, could be targeted towards achieving meaningful and lasting benefits to conservation that would aid recovery and restoration of marine and coastal environments. The potential for this related to the scale of potential development by marine industries means that MNG could have a significant role to play in restoration. Strategic planning to maximise the impact of MNG delivery would be extremely valuable.

Work on identifying strategic targets involved collating evidence on the state of marine and coastal environments, through formal reporting mechanisms (e.g., the UK Marine Strategy) and consultation with knowledgeable and experienced stakeholders.

This work was invaluable in identifying where actions are needed, and the results have been used to identify potential strategic targets which the Group agreed will be of significant value to conservation. It also established which of these would be achievable within the limits of what industry can deliver, as some aspects, considered important for creating recovery, can only be delivered through legislation so are beyond the reach of industry. These potential strategic targets were used as the basis for further consultation to assess the level of agreement amongst stakeholders that these targets would be beneficial and achievable.

The output of this consultation was a widespread endorsement of the targets. The resulting work is fully reported here[4]. An important output of the work is its use by Defra to support the development of marine Net Gain (MNG) policy.

Request for evidence

The Task and Finish Group is now seeking a better understanding of how best to deliver the identified targets. While there is considerable experience and understanding on how projects to deliver restoration and recovery are being planned and delivered locally, it is not yet fully utilised to inform strategic net gain delivery. It was therefore agreed that gathering this information could be of enormous value in providing recommendations on the delivery of the strategic targets, further ensuring MNG would be of real significance.

Additionally, examination of potential approaches and funding mechanisms already being used will allow for exploration of possible delivery approaches for MNG by industry, including partnerships and funding.

[4] https://www.marinedataexchange.co.uk/details/3513/2021-strategic-net-gain-task-and-finish-group-offshore-wind-evidence-and-change-programme-strategic-net-gain-targets-for-coastal-and-marine-environments/summary

On this basis, the Offshore Wind Evidence and Change Programme has approved funding for further work to examine existing approaches and gain stakeholders' views on delivery options for strategic net gain targets. The outputs of this additional work will formulate recommendations for the delivery of the strategic targets that could be used by industry to deliver MNG, and by Defra to support their work developing policy and procedures for marine MNG.

We would therefore be very grateful for your involvement and responses to this call for evidence to ensure we have the widest understanding possible of what is going on and, in some ways more importantly, how this is being done and how industry could support these initiatives through their own commitment to delivering MNG.

Peter Barham, Chair, Strategic Targets Task and Finish Group

Review of existing restoration initiatives

The Task and Finish Group has collected evidence to support their understanding of current interventions relevant to marine and intertidal Net Gain within the UK. This includes existing projects seeking to directly restore or re-establish habitat and species features, as well as projects that seek to reduce pressures on such features. The evidence has been collated within a database, linked below.

We would appreciate if you could review and update the data on known projects within the database, and/or add details on projects not yet captured, to support our knowledge of existing MNG projects and feed into our wider work aiming to analyse existing recovery and restoration projects and proposals.

Please click the following link to review and update the evidence database[5]:

>> Go to evidence database <<

Once you have finished, *please return to this survey* to answer some additional, broader questions on potential delivery options for marine net gain. In particular, the call for evidence seeks further information on the success of completed projects, any key challenges and how they were overcome, and any thoughts around indicators that might be used to assess the success of future projects. There is also a question concerning the geographic scales over which marine net gain should be addressed.

These additional questions should take approximately five minutes to complete.

[5] Call for evidence closed May 2023 - Database no longer available.

Call for evidence database template

Project Name	Project description	Location	Site coordinates	Site area (ha)	Project type	Project status	Project start date
The name of the project	Brief description of the project	Project location	Coordinates for central point within the project boundary	Total site extent. Please convert to Ha where possible or specify units	Creation/ restoration/ enhancement/ pressure removal* Please select one from the drop-down list. *e.g., removal of; fishing pressures, recreational disturbance etc.	Planned/underway/ complete. Please select one from the drop-down list	Project start date or anticipated start date if not yet underway
Free text	Free text	Free text	Free text	Free text	Drop-down list Creation Restoration Enhancement Pressure removal	Drop-down list Planned Underway Complete	Free text

Project end date (if applicable)	Target marine features	Key drivers	Links to regional/local priorities	Lead organisation	Delivery organisation(s)	Funding partner(s)
Project end date or anticipated end date if not yet completed	Types of habitats/ species that the project aims to create/restore/ enhance	Key reason for the project being undertaken. Please select one from the drop-down list.	Are there local/ regional drivers that have informed your project. If so, what? E.g., Local nature recovery strategy; local economic plans; industrial strategy	The overall lead project organisation	Organisations involved in project delivery in addition to the lead organisation	Organisations providing finance for the project/ funding mechanisms
Free text	Free text	Drop-down list Project mitigation/compensation Management authority actions within MPAs Management authority actions outside of MPAs Voluntary initiative Research Other (please specify)	Free text	Free text	Free text	Free text

Total project cost	Delivery cost	Monitoring and maintenance costs	Project outcomes (or expected outcomes)	Monitoring and evaluation	Criteria used to measure success	Source	Additional information
Total project cost or predicted cost if not yet started	Costs to deliver the project	Costs to monitor and maintain the works	What did the project achieve, or does it hope to achieve?	Types of monitoring/ evaluation undertaken to evaluate the project success – post project appraisal	The metrics/indicators used to measure the useful to measure the success of the project	Please provide a hyperlink to the project page	Please provide any additional relevant information
Free text	Free text	Free text	Free text	Free text	Free text	Free text	Free text

The following questions look to gain a broader view on potential delivery options for strategic marine and intertidal Net Gain.

Thinking about completed projects you are familiar with:

Q – How successful was the evaluation process, and what lessons were learnt as part of the evaluation?

Free text response

Q – What were the key challenges for project delivery, and how were they overcome?

Free text response

Q – Can you suggest metrics or indicators not already being used which would be useful to measure the success of intertidal and marine restoration or recovery projects?

Free text response

Q – Strategic targets will need to consider appropriate spatial scales. Do you think that marine plan level in England could be an appropriate scale for marine Net Gain?

- Yes
- No
- Please explain your reasoning - free text

Q – Would you be happy for the T&F Group to contact you further regarding the information you have provided*?

* *Contact details will not be shared to any 3rd parties and will be managed in line with strict GDPR policies. Information will only be used by T&F Group members to contact you to discuss, in further detail, your listed project to inform the groups understanding of delivery mechanisms for existing restoration and recovery projects.*

- Yes
- No
- If yes, please provide the Project Name and Your contact details below.

Appendix B. Existing recovery and restoration projects database

Clicking the link below will open the 'attachment', allowing the embedded data sheet to be opened (requires Adobe Acrobat Reader v.008 or above).

Financial information has been removed from the data sheet for data protection purposes.

Click here for embedded data sheet:

- StrategicMNG_Evidencebase_November2023.xlsx