A4S CFO LEADERSHIP NETWORK

EMBEDDING BIODIVERSITY NET GAIN INTO THE CAPITAL INVESTMENT PROCESS

Practical example: Yorkshire Water

YorkshireWater

WHAT

At Yorkshire Water we spend hundreds of millions of pounds each year on capital investment in reservoirs, treatment works and pipes to ensure we can provide reliable services for our customers, now and in the future. This capital investment process is supported by our Decision-Making Framework (DMF).[1] The DMF helps us make efficient expenditure decisions about our assets and operations that benefit our customers, society and the environment.

This year we have been working to incorporate biodiversity net gain[2] as part of a programme of improvements to the DMF. The DMF was developed initially as a collaboration between finance, sustainability and asset management. It has the capability to inform decisions across the whole asset management portfolio so that optimal decisions to manage risk and deliver affordable services can be made.

Incorporating biodiversity net gain into the DMF is one of the commitments that Yorkshire Water's CFO made as part of his membership of the A4S CFO Leadership Network. The network is made up of CFOs from large organizations who show personal leadership on bringing social and environmental considerations into business processes and strategy. Each year, members set specific commitments for their work on sustainability.

Learn more about the CFO Leadership Network >

1. You can find more information on our DMF here: www.yorkshirewater.com/about-us/capitals

2. Biodiversity net gain is an approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was beforehand. It is a policy concept under the UK's Environment Act 2021, applicable in England, which aims to create new habitat as well as enhance existing habitats, ensuring that the ecological connectivity they provide for wildlife is retained and improved. Further information can be found here: https://www.local.gov.uk/pas/topics/environment/biodiversity-net-gain-local-authorities

WHY

In the UK, the Environment Act 2021 introduced more prescriptive requirements for biodiversity net gain, which impact our capital delivery programme. The requirements include:

- Securing a minimum 10% gain, calculated using a defined biodiversity metric.
- Protecting biodiversity net gain in a habitat for at least 30 years, by using planning obligations or conservation covenants.
- Delivering biodiversity net gain on-site, off-site or using the new biodiversity credits scheme.

Historically, our DMF has considered various elements of natural capital, including land use, climate regulation, water quality, air quality, pollination and flood regulation. These elements can be selected or deselected depending on what is most relevant for the decision being made. Biodiversity as a metric has not generally been included in our multi-capitals assessments because data availability has been poor. Before Natural England launched its Biodiversity Metric tool,[3] there was also no single (recommended) approach to measure biodiversity.

We wanted to embed the new requirements into our DMF for any relevant future capex. This would enable us to quantify the impact on biodiversity for each new or refurbished asset and put a monetary value on the expected benefits (or costs) associated with it. This value would then sit alongside the other natural capital impacts as part of the full DMF multi-capitals assessment.

3. The Biodiversity Metric tool and corresponding guidance can be found here: publications.naturalengland.org.uk/publication/6049804846366720

HOW

Our approach involves a three-step process:

- Delivering individual proof-of-concept case studies
- Determining technical changes required for wider rollout
- Embedding into the system and into decision making

1. DELIVERING INDIVIDUAL PROOF-OF-CONCEPT CASE STUDIES

Our main challenge was how to deal with biodiversity net gain in terms of ambition and delivery. To consider this, we developed some proof-of-concept case studies as examples of projects that are helping deliver against our wider aspirations for biodiversity, including:

- Running biodiversity enhancement programmes and facilitating volunteering and access to our sites for our customers and colleagues.
- Undertaking conservation management of many of our local wildlife sites.
- Protecting endangered aquatic and riparian species, such as freshwater pearl mussel, white-clawed crayfish, greater water parsnip and tansy beetle.
- Working with catchment partners to deliver catchment-scale river habitat resilience programmes.

We performed biodiversity net gain assessments for each of the case studies, with ecologists providing technical input. They started by measuring baselines, and they then estimated the post-development outcomes. We used Natural England's Biodiversity Metric tool[3] to help us with the assessments and followed their process, set out in Figure 1, considering on-site options as much as possible before looking at off-site options. The tool measures the biodiversity unit value of the site before development, and the proposed value after development, with the net movement showing the biodiversity net gain.

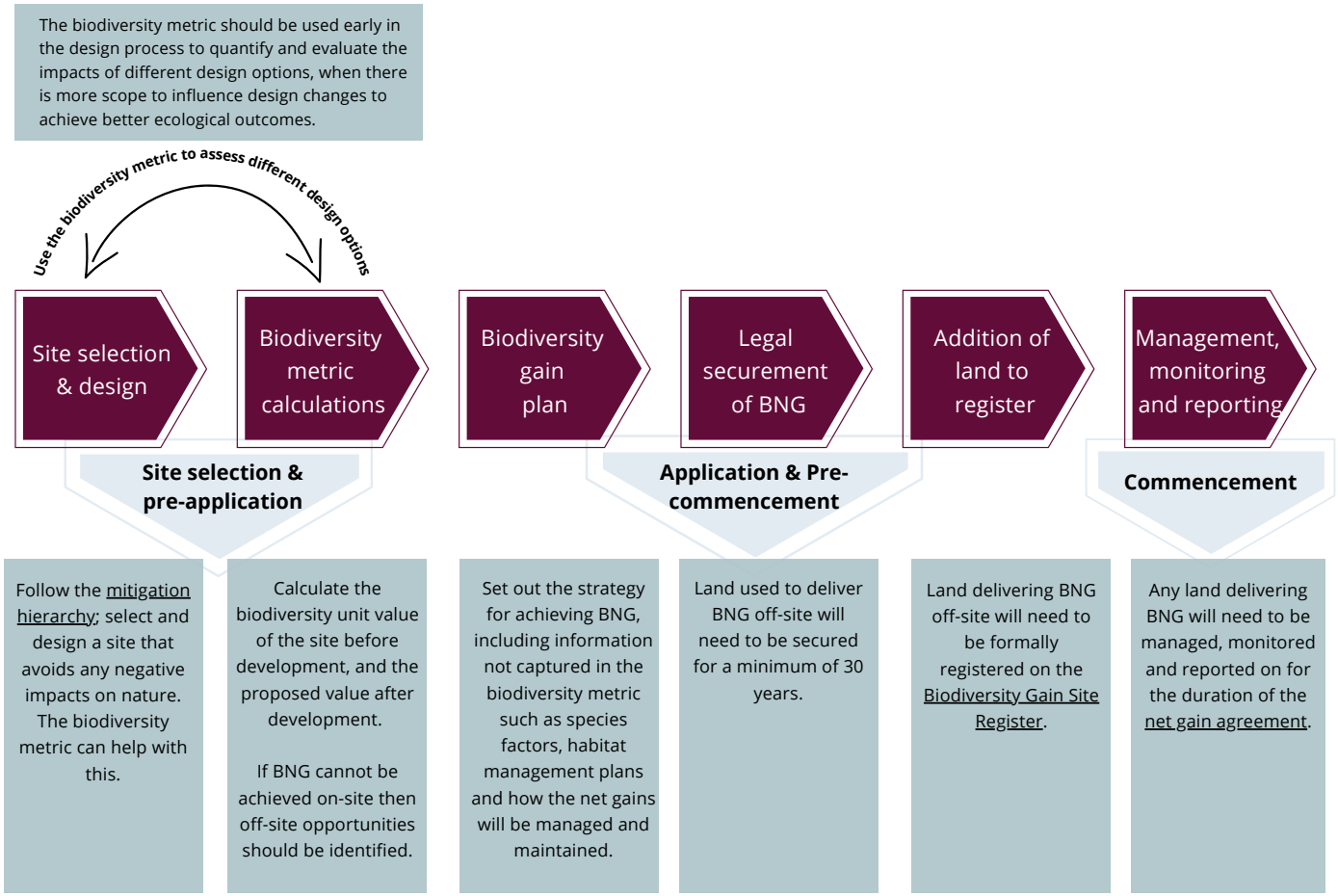


Figure 1: Natural England's biodiversity net gain (BNG) process diagram[4]

4. Extract from 'Biodiversity Net Gain – An introduction to the benefits', Natural England, available at: naturalengland.blog.gov.uk/wp-content/uploads/sites/183/2022/04/BNG-Brochure_Final_Compressed-002.pdf
To follow the links in this extract for the 'mitigate hierarchy', 'Biodiversity Gain Site Register' and the 'net gain agreement', please go to page 17 and 18 of the same document.

A combination of on-site and off-site options were used, as appropriate to each of the schemes we looked at. Figure 2 sets out the tool's process for measuring on-site and off-site baselines and options for creation, enhancement or accelerated succession[5] of habitats, hedgerows and rivers.

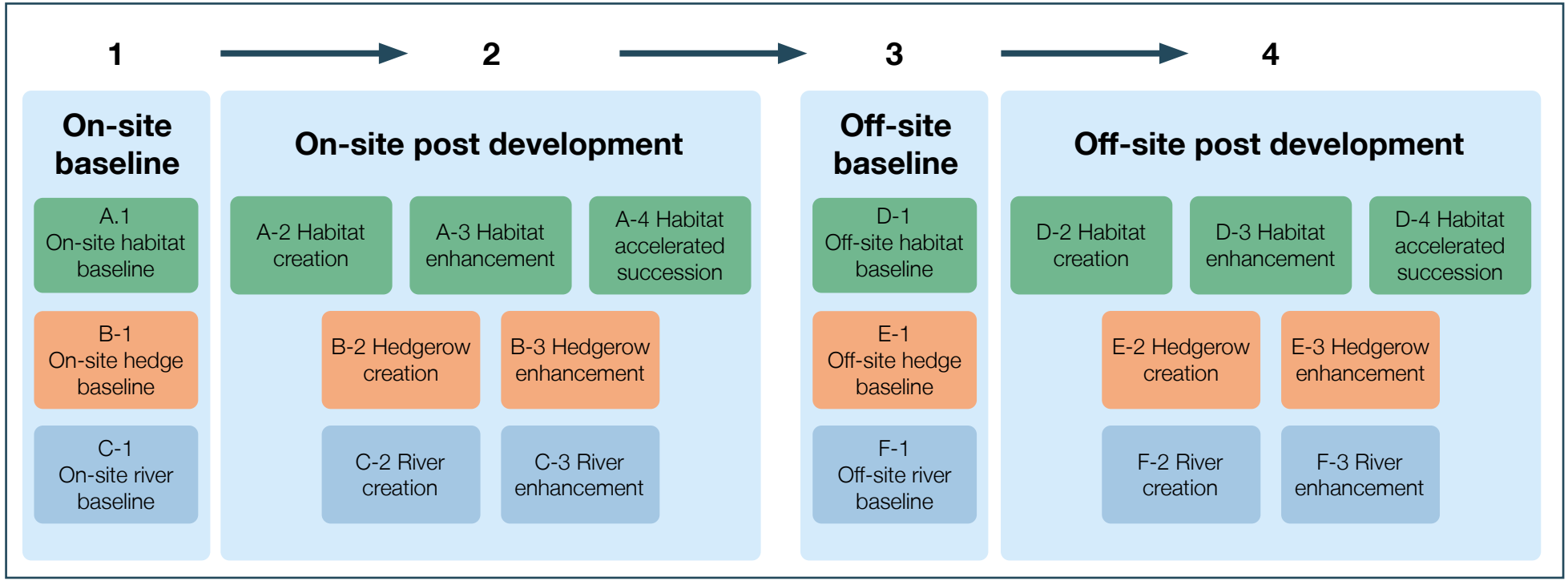


Figure 2: Biodiversity Metric tool

5. The process of directing plants, animals, and soil life towards complexity and diversity in a shorter time than would happen naturally.

We developed these case studies in the following areas:

SCHEME	EXAMPLE YORKSHIRE WATER PROJECT	BIODIVERSITY NET GAIN ASSESSMENT APPROACH
Water Industry National Environment Programme (WINEP)	Capex to reduce the phosphorus concentration in discharge from wastewater treatment works, comparing traditional wastewater treatment with treatment through an integrated constructed wetland.	This was a standalone biodiversity net gain assessment used alongside our existing DMF approach to inform the decision (see Figure 3).
Natural Environment Research Council (NERC)	Capex associated directly with NERC investment.	Biodiversity net gain was calculated and the associated positive and negative impacts on habitats were incorporated into our 'Land Use' measure in the DMF.
Water and Resource Management Plan (WRMP)	Capex linked to our WRMP, currently in development, which has a biodiversity net gain assessment as part of the environmental impact assessments of asset interventions relating to water supply (eg building treatment works or transfer pipes). These assessments only involved 'what could be lost' – ie the habitat types that would be impacted by construction.	Since the WRMP is a strategic resource plan, we also did not make any assumptions about how we would achieve 10% biodiversity net gain – we would need to investigate further to identify the preferred option.

A-1 Site Habitat Baseline

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

Ref	Broad Habitat	Habitat type	Area (hectares)	Distinctiveness	Score	Condition	Score	Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier	Suggested action to address habitat losses	Ecological baseline: Total habitat units
		Habitats and areas		Habitat distinctiveness		Habitat condition		Ecological connectivity			Strategic significance				
1	Sparsely vegetated land	Sparsely vegetated land - Ruderal/Ephemeral	0.42	Low	2	Poor	1	Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	Same distinctiveness or better habitat required	1.02
2	Heathland and shrub	Heathland and shrub - Bramble scrub	0.033	Medium	4	Poor	1	Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	Same broad habitat or a higher distinctiveness habitat required	0.16
3	Urban	Urban - Artificial unvegetated, unsealed surface	0.05	V.Low	0	N/A - Other	0	Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	Compensation Not Required	0.00
4	Urban	Urban - Developed land; sealed surface	0.014	V.Low	0	N/A - Other	0	Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	Compensation Not Required	0.00
5	Cropland	Cropland - Cereal crops	0.18	Low	2	N/A - Agricultural	1	Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	Same distinctiveness or better habitat required	0.44
6						Poor		Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1		
7						Poor		Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1		
8						Poor		Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1		
9						Poor		Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1		
10															
11															
12															
13															
14															
		Total site area ha	0.70											Total Site baseline	1.61

A-2 Site Habitat Creation

Condense / Show Columns | Condense / Show Rows | Main Menu | Instructions

Proposed habitat	Area (hectares)	Distinctiveness	Score	Condition	Score	Ecological connectivity	Connectivity	Connectivity multiplier	Strategic significance	Strategic significance	Strategic position multiplier	Time to target condition/years	Time to target multiplier	Difficulty of creation category	Difficulty of creation multiplier	Habitat units delivered
	Post development/ post intervention habitats					Ecological connectivity			Strategic significance			Temporal multiplier		Difficulty multipliers		
Sparsely vegetated land - Ruderal/Ephemeral	0.247	Low	2	Fairly Good	2.5	Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	4	0.867	Low	1	1.30
Wetland - Reedbeds	0.308	High	6	Fairly Good	2.5	Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	12	0.652	Medium	0.67	2.44
Urban - Developed land; sealed surface	0.017	V.Low	0	N/A - Other	0	N/A	Assessment not appropriate	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	1.000	Low	1	0.00
Urban - Artificial unvegetated, unsealed surface	0.092	V.Low	0	N/A - Other	0	N/A	Assessment not appropriate	1	Area/compensation not in local strategy/ no local strategy	Low Strategic Significance	1	0	1.000	Low	1	0.00
Heathland and shrub - Bramble scrub	0.033	Medium	4	Poor	1	Medium	Moderately connected habitat	1.1	Location ecologically desirable but not in local strategy	Medium strategic significance	1.1	1	0.965	Low	1	0.15
Totals	0.70														Total Units	3.89

Figure 3: Example biodiversity net gain calculation for an integrated constructed wetland

2. DETERMINING TECHNICAL CHANGES REQUIRED FOR WIDER ROLLOUT

The proof-of-concept stage allowed us to test the Biodiversity Metric tool and to incorporate the outcomes into decision making. However, we needed to do further work to bring the Biodiversity Metric tool into our own systems and processes. This involved updating our Enterprise Decision Analytics system to accommodate biodiversity net gain directly into the DMF.

We determined that the biodiversity measure would need two impact categories in Enterprise Decision Analytics: biodiversity units and biodiversity net gain. When combined, these two categories represent the biodiversity impact of the change in habitat. Monitoring both metrics allows us to measure the net impact on a project-by-project basis and also on a total land portfolio basis.

Recognizing that the quality of the data would vary, we included fields for recording the maturity and uncertainty of the data (see Figure 4). We also needed to be able to input these values across the 30-year life that the habitat must be secured for. These fields combine the totals of the habitat, hedgerow and river impacts that were calculated in the Biodiversity Metric tool (see Figure 5).

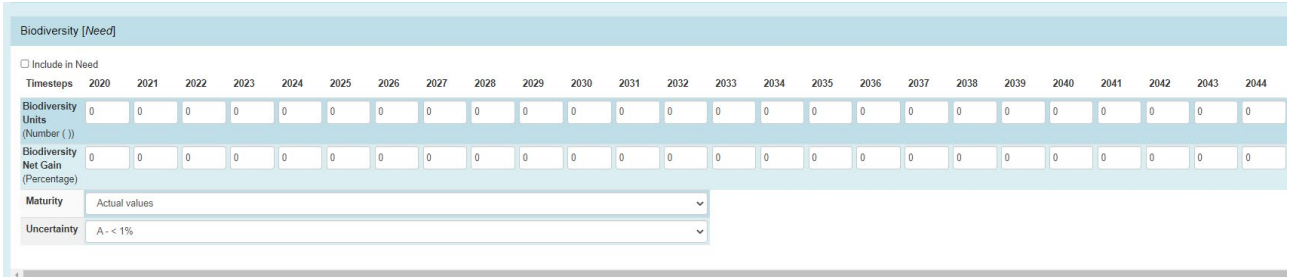


Figure 4: Proposed new fields in Enterprise Decision Analytics

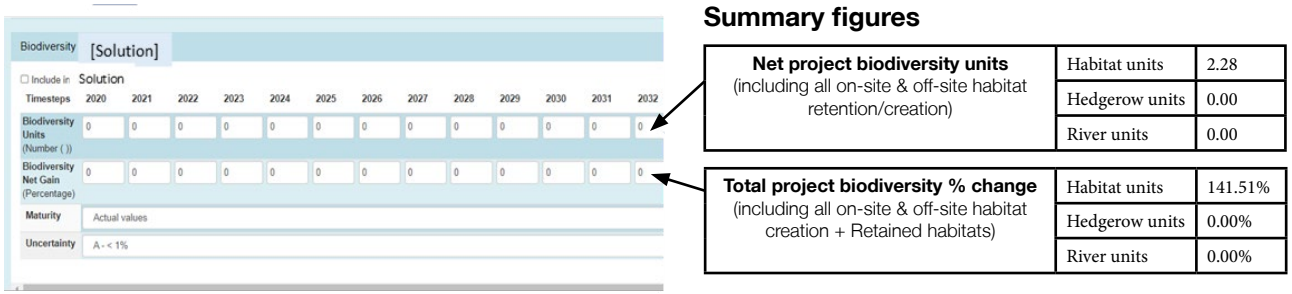


Figure 5: Transfer of biodiversity net gain assessment into the DMF

Incorporating the outputs from the biodiversity net gain assessment in this way (rather than being hidden within the 'Land use' category, like in the pilots) means this data can be used as a discrete metric for decision making. For example, we can identify the option (or set of options) with the highest biodiversity units. We can also use this information to determine the total biodiversity units created or lost from a set of capital solutions.

As valuing biodiversity directly is complex, we calculate monetized impacts indirectly from the quantitative change in the habitat area and the downstream impacts on ecosystem services. These are assessed in Enterprise Decision Analytics as part of natural capital.

3. EMBEDDING INTO THE SYSTEM AND INTO DECISION MAKING

There are many factors to consider as we work to embed this new approach into the DMF and the decision-making process it supports. This stage is ongoing.

We have already:

- Updated our engineering specifications to incorporate the new biodiversity net gain measure. This will be rolled out at the start of the next financial year.
- Agreed where specialists will need to be involved to ensure appropriate measurement quality.
- Rolled out a data capture process among the ecology supply chain so we are using single shared GIS maps and processes to record information.
- Started mapping our biodiversity baseline across our estate, with 11,000 hectares already mapped (see Appendix 1 for an example).
- Set up a series of training sessions for the relevant project teams.

Further work is anticipated to:

- Collaborate with land and property colleagues to get a framework in place to manage the habitat creation and management elements that are likely to be needed.
- Identify suitable land parcels on catchment land to allow us to deliver the required biodiversity enhancements. The intention is to seek land parcels by local government jurisdiction, so biodiversity enhancements are close to the relevant capital project site affected.
- Develop local nature recovery strategies about where it would be good to deliver mitigation projects.
- Define information requirements to enable effective decision making at each stage in the capital delivery process. Build a robust auditable process to inform effective risk-and-value-based decision making.
- Ensure that the process for analysing options includes the biodiversity assessment, as appropriate.
- Update our decision-making guidance to ensure transparency and accountability.

- Provide visibility of both the proposed and deselected options to decision makers, such as the Business Investment Committee, chaired by our CFO.
- Align the process with our regulatory reporting requirements on biodiversity.
- Provide training on ways of working to encourage standardization of the approach and culture change.

TOP TIPS

SET YOUR AMBITION AT THE START

Biodiversity is complex and it's not possible to measure everything. Define the key outcomes you want to achieve and use this to identify appropriate measurement tools.

COLLABORATE WITH SPECIALISTS

Measuring and valuing biodiversity and associated gain or loss is a specialist area. The skills needed can be drawn, as required, from in-house or external economists, ecologists, sustainability professionals and accountants. We also sought input from our engineering and capital delivery colleagues.

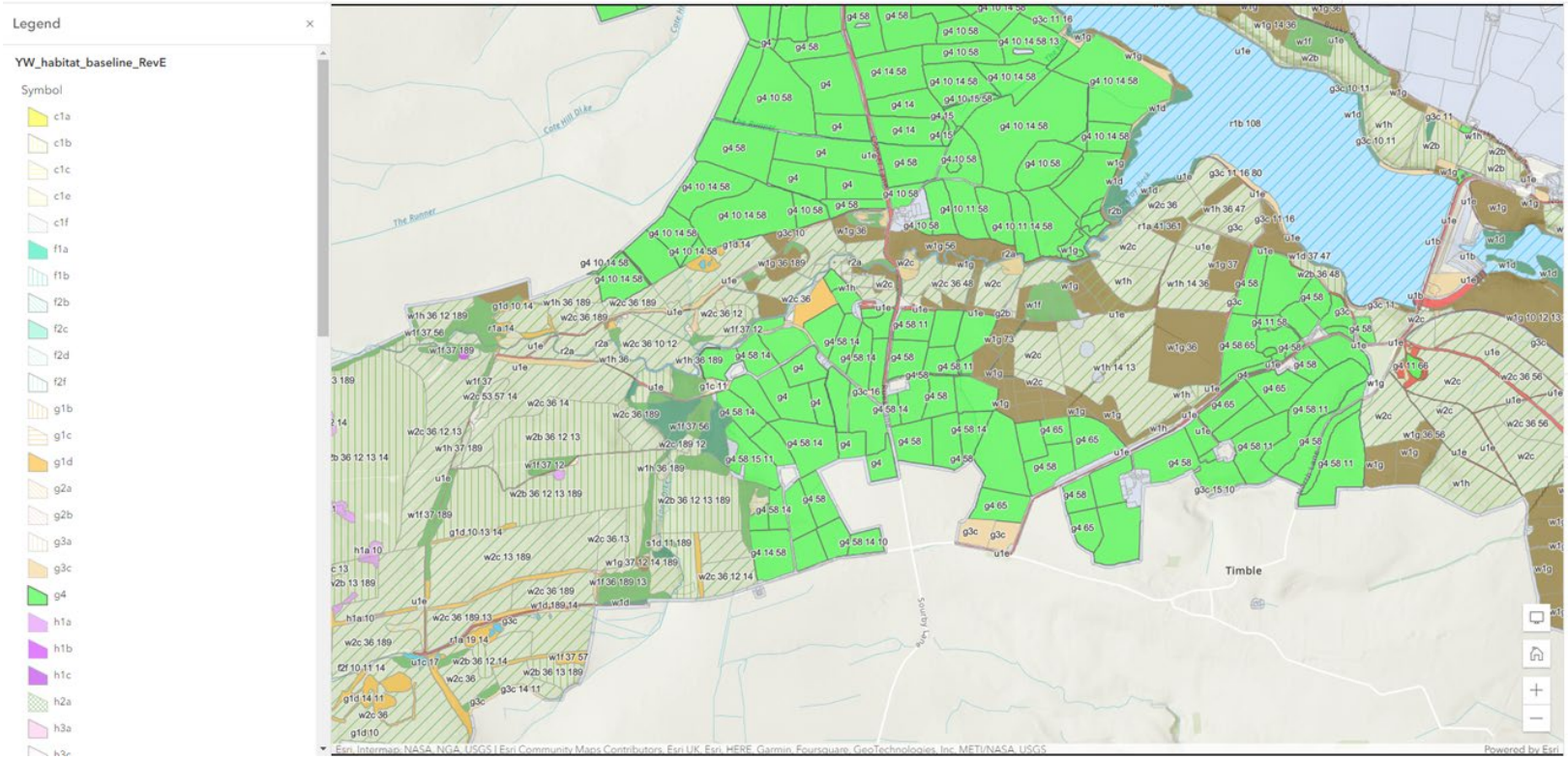
TEST YOUR IDEAS THROUGH A PILOT STAGE

Piloting your approach allows you to test your ideas, learn, iterate and adapt as you go, ensuring your approach can be applied to a variety of different circumstances.

BE PROACTIVE ABOUT CULTURE CHANGE

Getting the system change right is only part of the process – gaining buy-in from stakeholders and changing culture is essential for successful implementation.

APPENDIX 1: EXAMPLE HABITAT BASELINE MAP



GET IN TOUCH OR FIND OUT MORE

@PrincesA4S

Accounting for Sustainability (A4S)

ThePrincesA4S

info@a4s.org

www.accountingforsustainability.org

More from the A4S Essential Guide Series:

www.accountingforsustainability.org/guides