



Lessons learned from catchment-based trading in nature in south-west England



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Abstract

Highlights

- Catchment-based markets can integrate private finance into nature's recovery
- The Bristol Avon Catchment Market created a novel two-sided market
- A central Market Operator contracted independently with suppliers and buyers
- A market settlement algorithm based on the Lindsay Mechanism shared surplus fairly
- With limitations, the market settled with environmental and socioeconomic benefits

Abstract

This study analyses a 'real world' catchment-based market seeking to integrate private finance into nature's recovery, exploring design, development and early implementation of the Bristol Avon Catchment Market (BACM) in western England. Novel features of the BACM include creation of a two-sided market wherein nature-based projects proposed by suppliers develop contracts with a Market Operator. The Market Operator assesses environmental units amenable for purchase by buyers, potentially aggregating multiple supplier schemes to meet the needs of discretely contracted prospective buyers. BACM development relied heavily upon grant and in-kind funding to establish the market mechanism and upskill of trainees. Early stages of BACM development were limited only to Biodiversity Net Gain as unclarity in the policy environment prevented stacking other ecosystem services, limitations in successive iterations of the Defra Biodiversity Metric tool also limiting qualifying habitat types. Nonetheless, two early market rounds were settled with benefits to successful landowners and upskilling of trainees. Maintaining the primary focus on supporting ecosystems and nature's recovery is vital, avoiding narrow framing on single exploitable services. This study demonstrates the operability of the BACM, highlights a need for greater clarity in the policy environment, and generates generic learning for development of nature-based markets.

Introduction

Interest in nature-based solutions (NBS) – use, protection or restoration of natural or modified ecosystems to address societal challenges with biodiversity benefits¹ – has expanded over recent years. NBSs potentially contribute significantly to issues including climate change,² flood management,³ water security,⁴ urban air quality and microclimate,⁵ and suppressing emergence and spread of zoonotic diseases.⁶ However, NBSs are not without their critics and controversies.⁷ Diverse market-based approaches have emerged, mainly under Payment for Ecosystem Services (PES) arrangements. PES, initially conceived as simple market transactions between ‘buyers’ (beneficiaries) and ‘sellers’ (providers) of desired ecosystem services,^{8,9} has subsequently evolved in vision beyond narrow neoclassical economic principles, particularly in developing world settings, incorporating wider aspects including valuation of nature, development needs of rural communities, creation or engagement of relevant institutions, and dialogue about distribution of benefits.^{10,11,12}

Water is a vector of multiple ecosystem services, integrating influences from broad watersheds. Consequently, significant markets have emerged at catchment scale including the widely cited raw water protection scheme in France’s Vittel water catchment^{13,14} and PES-like arrangements from 1997 protecting three major sub-catchments (Croton, Catskill and Delaware) serving as substantially unfiltered sources for New York City’s water supply¹⁵ saving the City billions of dollars by averting the need to build and operate a massive filtration plant.¹⁶ PES or PES-like schemes in UK catchments include instigation from 2005 of SCaMP (the Sustainable Catchment Management Programme) to protect raw water quality in upland catchments with simultaneous biodiversity improvements in north-west England,¹⁷ and initiation in 2010 of the ‘Upstream Thinking’ programme implementing natural landscape-scale solutions to protect raw water quality in south-west England.¹⁸ Increasing implementation of natural flood management (NFM) also embodies aspects of catchment-bound markets.¹⁹ Other pioneering examples globally are documented by OECD (2010)²⁰ and Everard (2020).²¹

The Environment Act 2021 set targets for recovery of the natural world in England across four priority areas: air quality, biodiversity, water and waste. A ‘finance gap’ of £44-97 billion (central estimate £56 billion) over the next 10 years was recognised by GFI.²² UK government interest in accelerating private investment alongside public funding in nature recovery following the Covid-19 pandemic and withdrawal from the European Union took the form of ‘cornerstone funding’ to develop a portfolio of large-scale demonstration projects at catchment or city-scale seeking to develop multi-service markets to assist nature’s recovery following advice from the UK’s Broadway Initiative.²³ UK Government

subsequently published a 2023 Green Finance Strategy²⁴ instigating a programme to establish a high-integrity Nature Investment Standards framework for UK nature markets, and also *Nature markets: A framework for scaling up private investment in nature recovery and sustainable farming*.²⁵ The Department for Environment, Food and Rural Affairs (Defra) published a supporting policy framework for scaling up nature markets.²⁶ A coalition of organisations²⁷ recognised that current spending is not reversing the decline of nature in the UK. It is vital that novel nature-based markets are multi-functional by design, not simply exploiting and trading only in selected narrow ecosystem services akin to contemporary intensive agriculture and marine capture fisheries that degrade productive ecosystems and their wealth of services.²¹ Emerging nature markets designed to aid nature’s recovery must necessarily depart from this established neoclassical paradigm, taking full account of systemic impacts upon and optimisation of the multiple ecosystem services benefits provided by ecosystems.²¹ Recent catchment-based market initiatives in the UK addressing multiple service outcomes in catchment markets include the Yorkshire Integrated Catchment Solutions Programme,²⁸ the Bristol Avon Catchment Market (2024),²⁹ the Somerset Catchment Market (2024)³⁰ and, nascent at the time of writing, the Solent Catchment Market (2024).³¹

This study explores a catchment-based market approach being implemented in the Bristol Avon catchment in south-west England with the stated purpose of creating a world-leading market to deliver local, high-impact and verified projects to restore nature and deliver a range of environmental services including increased biodiversity, carbon reduction and natural flood management.³² Climate and nature recovery are further intended outcomes, rather than responding only to narrowly framed legacy regulations. This study assesses the successes of this evolving market, its innovations and how it meets its stated purpose, limitations encountered, testing for systemic approach, and making recommendations for further market development. The Methods section provides an overview of the Bristol Avon catchment and the approaches taken to information-gathering and evaluation of the emerging Bristol Avon Catchment Market (BACM). The Results section describes how the market has been implemented to date with emerging learning. The physical and policy contexts of this case study analysis are British, but the principles and lessons emerging have global relevance.

Methods

2.1 The Bristol Avon catchments

The Bristol Avon catchment encompasses approximately 280,000 hectares in south-west England (Figure 1). The diverse sub-catchments of the Bristol Avon face challenges including high phosphate concentrations and sediment inputs, flood risk and loss of natural habitat, exacerbated by a changing climate.³³ Here, as nationally, increasing private investments in nature recovery are necessary to address UK Government targets to achieve net zero emissions by 2050³⁴ as well as legally binding targets to halt the decline in species populations by 2030 and subsequently increasing them by at least 10% relative to current levels by 2042 including restoring water bodies to their natural state.³⁵ An assessment of demand for offsite biodiversity compensation from built development in the Bristol Avon catchment, taking account of historical housing data and differing mitigation requirements of Local Planning Authorities across the Bristol Avon catchment, projected a total possible potential demand of 237 Biodiversity

Units in years 2023-2024 with annual growth projected, creating a significant opportunity for nature recovery in the region³⁶ (see **Figure 1**).

2.2 Assessment of the BACM scheme

Documentation of market design, execution and governance was derived from review of relevant websites, reports, linked literature and interviews with key players in partner organisations. These partner organisations included leading staff from Wildlife Trusts and the Market Operator (EnTrade). Interviews were also conducted with institutions operating or exploring catchment market approaches (Westcountry Rivers Trust, Wye and Usk Foundation, Hill/Stone/Wood catchment-based flood insurance). Comments from individuals are anonymised.

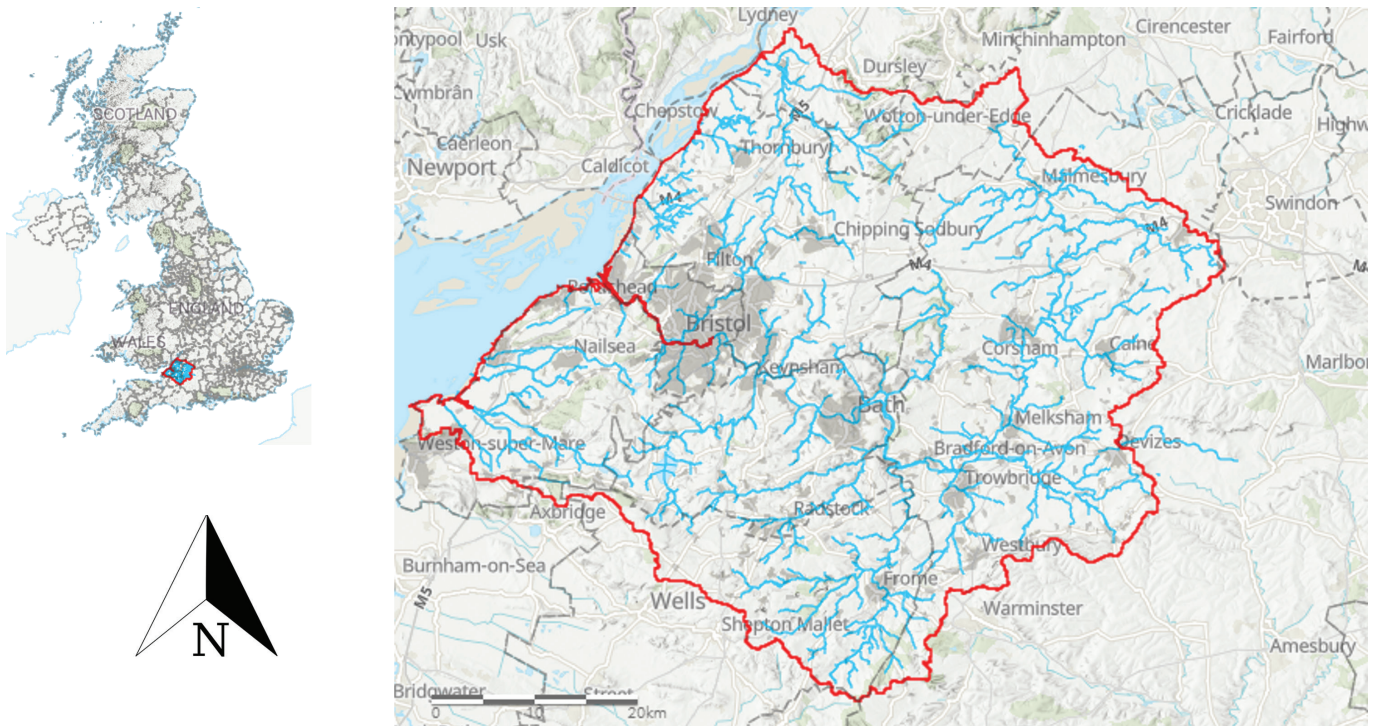


Figure 1. Map of the Bristol Avon catchment

Results

3.1 Catchment focus and engagement

The purpose of the BACM – to create a market to deliver catchment-bound, high impact and verified projects to restore nature and a range of ecosystem services – was addressed by engaging relevant partners within the Bristol Avon catchment boundary. Substantial efforts were expended during market development on project design, engaging potential scheme suppliers and buyers, and assessing supply-side potential and demand for environmental units. Core BACM partners and roles included:

- Two regional nature conservation and sustainable living NGOs: Avon Wildlife Trust (AWT); and Wiltshire Wildlife Trust (WWT);
- Market Operator: EnTrade, established for the purpose of ensuring high integrity in market operation;
- Local Planning Authorities (LPAs) covering areas of the Bristol Avon catchment where development units were required. LPAs will become Competent Authorities verifying purchased Biodiversity Units, though this was not a statutory requirement in early market rounds. In future, LPAs may potentially assume this role for additional marketed ecosystem services such as nutrient neutrality. High-integrity and transparent market mechanisms are therefore essential to satisfy LPAs that schemes will provide outcomes required by buyers for environmental units linked with planned development.
- Potential suppliers of nature-based projects (NBP) – or ‘sellers’ – seeking funding to implement nature creation, enhancement or restoration projects to an agreed plan and timescale, in turn generating tradeable ecosystem services. Suppliers included both independent landowners, LPAs and Wildlife Trusts.
- Prospective buyers of environmental services including, for example, local house builders, water companies and other interests. The most significant driver for the purchase of environmental services is a requirement for 10% uplift in biodiversity associated with development schemes measured by Biodiversity Net Gain, which became mandatory in England in early 2024, as well as voluntary demand such as for carbon units. A further driver is open disclosure for non-statutory purposes, for example transparently addressing nature-related risks under the Taskforce on Nature-related Financial Disclosures.³⁷ Additional potential drivers include increased supply chain resilience to reduce corporate risk

and fulfil customer demands for sustainable supply chains.²³

- Wessex Water, the regional water utility company, interested in improved catchment management.

3.2 Grant funding for early stages of BACM development

The longer-term intention is that independent NBP suppliers will self-fund evaluations of enhancements using the Biodiversity Metric. However, initial BACM development and piloting was substantially funded by grants from a range of funders totalling £1,997,600 (summarised in **Box 1**), demonstrating that establishment of high-integrity markets requires substantial initial investment.

Box 1: Funders of early rounds of BACM

- Primary funding for BACM development and management was secured in 2021 from Round Two of the UK Government’s Green Recovery Challenge Fund (GRCF). GRCF was delivered through the UK’s National Lottery Heritage Fund (NLHF) in partnership with two government environmental regulators (Natural England, Environment Agency), allocating grants to environmental charities and partners in England intended to create jobs and stimulate growth in nature recovery and conservation.³⁸ The intent was to help the nation ‘build back greener’ following the Covid-19 pandemic by investment in projects to restore nature and tackle climate change. The BACM proposal submitted by the two Wildlife Trusts was awarded a £1,777,600 grant from GRCF (77.37% of total project budget) running from January 2022 (with partial permission to recruit staff from September 2021 pending signing of all necessary partnership agreements) to March 2023. Due to challenges to market operation, including delays in BNG becoming statutory whilst recognising successes achieved with development and completion of MRI, Defra granted an extension to the BACM project to June 2023 without additional funding.

- An additional contribution of £120,000 was provided from the UK Government's Kickstart Scheme. The Kickstart Scheme ran from 2020 to January 2023 providing funding to employers to create jobs for 16-to-24-year-olds receiving Universal Credit.³⁹ This Kickstart funding was intended to support 12 posts under the BACM. Match funding of £100,000 was provided by Wessex Water toward Kickstarts.
- The regional water utility, Wessex Water, provided support throughout the BACM programme amounting to approximately £500,000 including payments for specific elements (including the £100,000 matching support to extend the Kickstart scheme, and also funding Ecology Placements with associated field kit, Wheatley Young Partners and EnTrade consultancy to develop market design, legal fees to develop framework legal agreements, work undertaken by Exeter University to develop the biodiversity market settlement mechanism, staff time particularly for EnTrade operating the Market Rounds, development and hosting of the website, and further 'in kind' support).

3.3 Institutional arrangements and market stages

Institutional arrangements central to BACM included establishment of a Market Operator (EnTrade) to provide a simplified, two-sided market scheme for both suppliers of NBPs and prospective buyers of environmental services, under which suppliers and buyers each contract independently with the Market Operator rather than directly with each other.

Initial work by the Wildlife Trusts and the Market Operator, significantly supported by grant funding, established the feasibility of the BACM, including potential interest from NBP suppliers and assessment of demand from prospective buyers of environmental services. Awareness-raising about the nascent BACM was achieved through a Buyer Engagement Strategy developed in November 2021, entailing networking, marketing and events. A project website publishing buyer information, including a Business Opportunities Statement,²⁹ was launched in February 2022 as a precursor to launching an Expression of Interest (EOI) round for both prospective suppliers and buyers.

- Prospective suppliers of NBPs developed and submitted offers to the Market Operator, including estimated costs for scheme implementation. Subsequent maintenance

and monitoring throughout project life was calculated as fixed annual payments by the Market Operator. Incentives for engagement by landowners include fair payment for creating and maintaining environmental projects (typically creation and/or enhancement of grassland, scrub, woodland, hedgerows, ponds and wetlands) enabling diversification of farm revenues and contributions to nature's recovery. As habitat enhancement schemes may create implications such as inheritance tax, suppliers were advised to obtain independent legal and financial advice, potentially building these costs into the proposed supplier offer.

- The Market Operator had also undertaken preparatory work with the UK's National Farmers' Union (NFU) to develop template legal agreement framework contract appropriate for landowners (available on the BACM website: <https://www.bristolavoncatchmentmarket.uk/>).
- The Market Operator then took responsibility for assessing potentially tradable 'environmental units' on the basis of ecosystem services generated by NBPs. In practice, the Wildlife Trusts assessed potential Biodiversity Unit generation using the UK Government's Biodiversity Metric tool⁴⁰ (see also Annex).
- Prospective buyers of environmental units outlined the types and number of units required, also making agreements to be screened against an BACM Ethical Buyer Framework (EBF) comprising a checklist (**Box 2**) against which evidence was required to demonstrate genuine commitment to supporting nature's recovery.⁴¹ Development of the EBF was novel, imposing a multi-faceted, pro-nature and values-based filter for prospective buyers.

Market development then progressed with participants formally registering. Wildlife Trusts developed Landholder Information Packs for landowners ahead of market registration, comprising maps of screened projects and template legal agreements. The Market Operator then developed a Catchment Opportunities Statement (COS) on the basis of formal market registrations by both suppliers and buyers.

The COS served as a key element of market design ensuring transparency for market rounds enabling suppliers to make informed offers, and buyers to make informed bids. This informed a subsequent stage of market development in which:

- Prospective suppliers of NBPs submit offers based on plans for habitat enhancement or creation. The costs of associated monitoring and maintenance are set by the Market Operator in consultation with the Project Board. The BACM team screened prospective supplier NBPs, ensuring that suppliers understood the market rules and had no conflicting agreements in place and that they also avoided heritage,

Box 2: The BACM Ethical Buyer Framework (EBF)

Specific requirements for participation by buyers in the BACM under the Ethical Buyer Framework (EBF) include provision of evidence that the prospective buyer:

- is committed to improving their ecological footprint over time;
- intends to use environmental units purchased through the market to drive genuine environmental improvements;
- will not resell units outside of the BACM, at least in early Market Rounds establishing the scheme;
- attests that they don't participate in defined sets of environmentally damaging or socially unacceptable activities; and
- will acquire nature-based solutions as a mechanism to offset damaging practices where there are credible alternatives, essentially obeying the mitigation hierarchy.⁴²

In addition:

- For carbon units, buyers should have a public commitment to achieving net zero emissions by 2040 and be committed to developing and implementing a credible plan to achieve net zero emissions that follows, or is equivalent to, guidance in the Science-based Targets Initiative (SBTi);⁴³ and
- For biodiversity gain or nutrient mitigation units, buyers should demonstrate that development: proposals are compatible with local policies, plans and/or supplementary planning documents; will not result in the loss of irreplaceable habitat such as ancient woodland; and is not resulting in loss of land designated specifically for nature conservation.

archaeological or habitat damage, and that proposed NBPs were in line with local nature recovery strategies.

- Potential buyers of environmental units agree with the Market Operator to standard terms and conditions under an Environmental Credit Supply Agreement (ECSA). The ECSA

specifies their required type and quantity of units, delivery dates and payment schedule.

- Binding commitments from suppliers and buyers then formed the basis of a competitive bidding process.

The market settlement process then followed. Many prior environmental markets have been based on reverse auctioning, though this approach poses a significant obstacle compromising effective market settlement as NBP suppliers are incentivised to inflate their costs whilst buyers may underbid.⁴⁴ Alternative solutions include use of fuzzy logic to address a wider set of parameters.⁴⁵ To overcome the fundamental problem of mismatch, the BACM utilised EnTrade's work with Exeter University to develop an automated market settlement algorithm founded on the Lindsay Mechanism, a 'balanced-winner-contribution (BWC) rule' approach based on Shapley Values as a fair means for dividing surpluses under which 'winning' traders make equal contributions to each other's share of the gains from trade.⁴⁶ The rules coded into the Lindsay Mechanism are outlined in Box 3. The Lindsay Mechanism allocates surpluses from trade equally between settled NBP suppliers (bonus payments to undertake nature-based projects) and buyers (discounts relative to bids for verified environmental units). This incentivises suppliers to avert inflating offers and buyers to develop their maximum offers on the promise of fair sharing of surpluses between participants. Market settlement was an entirely automated process avoiding human intervention. NBP suppliers and buyers are both bound by the outcomes of market settlement. The BACM was the first initiative in the world to apply a two-sided market through a single settlement mechanism.

Following market settlement:

- Suppliers of settled NBPs enter into a Nature Based Project Agreement (NBPA) contract with the Market Operator to deliver the agreed plan, including monitoring and maintenance, for which they receive payment.
- NBPA's are inserted into legal agreements with the relevant LPA, which has enforcement capabilities under the Environment Act 2021. In early market development rounds, these were under Section 106 agreements (legal agreements between planning permission applicants and the LPA to mitigate impact under the Town and Country Planning Act 1990). In future, Conservation Covenants (private, voluntary agreements to conserve the natural or heritage features also under the Environment Act 2021) may also fulfil this role.
- For settled NBPs generating environmental units, the Market Operator makes an initial payment for project establishment to supplier(s) and underwrites the 30-year management and monitoring expenses, redirecting payments from buyers of the rights to environmental units.

Box 3: Basic principles enshrined in the Lindsay Mechanism for market settlement

- All trading rules were met in line with relevant standards, including as set out in the Defra Biodiversity Metric;
- The buyer gets at least the quantity of environmental units that they bid for, or else no deal is settled;
- Buyer payment must cover the supplier's offer incorporating associated fixed costs (market operator fees, compliance, and monitoring costs, land use and maintenance costs), or else no deal is settled.
- Aggregation of environmental units generated by multiple suppliers to meet the requirements of buyers means that multiple trades can be settled relative to the needs of a buyer.
- The automated market settlement process identifies deals that generate the most surplus, and is expected to result in a surplus* that is shared equally between buyers of environmental units and NBP suppliers.
- If suppliers ask for more than buyers bid, the NBP will not settle.
- If NBP suppliers ask for less than buyers offer, the Lindsay Mechanisms allocates surplus between partners.

* Surplus = Total value of successful buyer bids MINUS total value of successful NBP supplier offers MINUS cost of running the market.

- As the Market Operator is responsible for calculating environmental units generated from NBPs, the Market Operator insulates NBP suppliers from risk that projects delivered according to the Project Specifications and Management Plan underperform for reasons outside of suppliers control, such as climate change or miscalculations, and consequently generate a lower number of units. Buyers are similarly insulated from the risk of underperformance by the terms of the ECSA, which requires the Market Operator to replace units from an alternative source in the event the agreed quantity of units cannot be supplied from the source NBP.

- Buyers of Environmental Units are bound by an ECSA with the Market Operator specifying the type and quantity of environmental units, delivery dates and payment schedule. Any units they purchase are recorded on the EnTrade unit registry, and will be uploaded to national registers once available. This ensures that LPAs and the planning system can trace relevant units linked to both buyers of environmental units and NBP suppliers.
- The Market Operator holds a Credit Reserve of settled units across projects as a buffer in the event of a NBP failing to meet its targets, which would necessitate the Market Operator releasing further units to fulfil buyer contracts. A Credit Reserve is held by the Market Operator over the life of the contract: a 30-year horizon for Biodiversity Net Gain; and an 80-year horizon for nutrient markets. Retained environmental units in excess of a minimum reserve can be sold in future markets and paid back to suppliers.

When the buyer submits a development proposal to an LPA or redeems Biodiversity Units against voluntary commitments, rights to Biodiversity Units allocated to the buyer on market settlement are 'Redeemed' and become 'Issued Biodiversity Units'. At this point, the value of the Biodiversity Units is fixed, and they are retired so cannot be resold. As Biodiversity Units and some other types of environmental credits are expected to increase over the lifetime of NBPs – for example through improved biodiversity, habitat maturity, or carbon sequestration – fewer units may be available in early stages with more units becoming available for redemption over time. If Biodiversity Units are redeemed before project maturity, the quantity is calculated according to risk multipliers built into the Defra Metric.

The competent authority for registration of environmental units and qualifying NBPs is the relevant LPA. Prior to BNG becoming statutory, the BACM team worked closely with LPAs, enabling them to gain confidence that projects were appropriately located and designed through pre-market reviews.

An independent Environmental Markets Board has been established to provide market oversight and ensure compliance with agreed market rules and processes.⁴⁷ Establishment of this independent Board followed recommendations of the Broadway Initiative²³ and Financing Nature Recovery UK (2023),²⁷ with Wessex Water offering to test and demonstrate how Environmental Markets might work in practice building on its experience with nutrient trading in Poole Harbour. Although initially providing oversight of the markets operated by EnTrade, including BACM and the Somerset Catchment Market, the Environmental Markets Board is expected to assume a growing role scrutinising and assuring more catchment-based and other environmental service markets.

The flow of activities and responsible partners is illustrated in **Figure 2**.

3.3 Iterative market implementation

Considerable innovation and continuous improvement occurred in early rounds of BACM implementation, including via two Market Rounds. In advance of the first round, the BACM team carried out extensive market development, including drafting standard agreements and marketing materials, engagement of potential buyers of environmental services, and engagement with landholders and managers potentially providing NBPs. The BACM team also produced guidance covering grassland, scrub mosaic, woodland and wetland management and enhancement.

The EOI process for potential buyers under Market Round One (MRI) ran from September 2022 to 3rd February 2023, attracting multiple, non-binding prospective submissions from potential business buyers with interests in Biodiversity Gain, Carbon, Nutrient Neutrality and Natural Flood Management. Most of these businesses specified the number of required Environmental Units. In practice, only Biodiversity Units were included under MRI, which also did not allow futures trading. The Defra Biodiversity Metric tool (see Annex) was used to calculate Biodiversity Units likely to be generated by NBPs.

Candidate NBPs under MRI EOI were screened by the Wildlife Trust team for deliverability and compliance, ensuring any required consents were identified prior to settlement. Suppliers of NBPs undertake to manage projects in return for up-front establishment costs, with the Market Operator adding fixed annual payments based on land value and maintenance requirements, the total sum plus operating costs incorporated in payments by buyers. Only specific NBPs were able to progress, limited by the adequacy of the Biodiversity Metric tool as described in the Annex.

In practice, the MRI timeframe was ambitious, market development requiring significantly more work than initially anticipated. Contributory factors included delays in Biodiversity Net Gain becoming statutory and uncertainty about stacking of Biodiversity Units with other services. Furthermore, although carbon was the most widely demanded voluntary service, no suitable woodland projects for carbon units were included due to difficulties in quantification and as woodland creation schemes mature only slowly with low numbers of units generated in early years in return for potentially high project costs. Furthermore, UK Government guidance published in February 2023,⁴⁸ late in the MRI cycle, stated that carbon and biodiversity units could

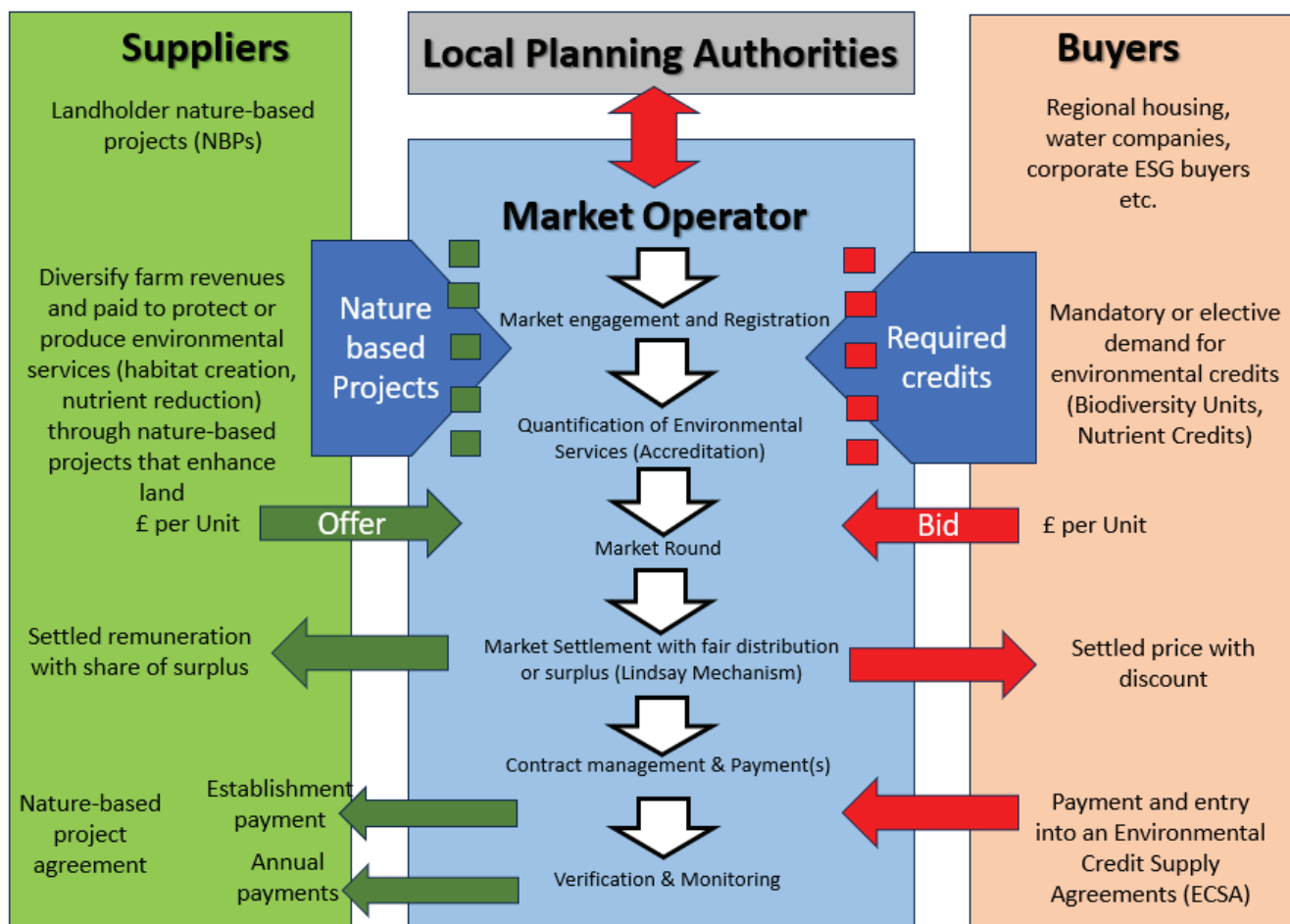


Figure 2. Roles of key partners in the BACM and flow of activities

not be stacked as the Biodiversity Metric related principally to vegetation whilst carbon fell under different, largely global standards such as the Woodland Carbon Code.⁴⁹ This unfortunately denied landholders multiple potential income streams from single targeted interventions. The consequent typical focus of NBPs under MRI was reduced to lower-quality farmland as this offered the greatest potential for enhancement as measured by Biodiversity Metric score. Consequently, many prospective buyers submitting EOIs did not proceed to formal bid registration. Tying land into potentially intergenerational agreements also raised concerns amongst some landowners, who subsequently declined to formalise their offers.

Five projects were subsequently formally registered under MRI with a potential total of 34.08 Biodiversity Units. MRI settlement on 15 June 2023 resulted in a total of 1.426 hectares of habitat enhancement projects supplying 7.137 biodiversity units comprising: 0.064 hectares of Scrub mosaic (rights to 0.252 Biodiversity Units); 0.193 hectares of Wetland (1.062 Biodiversity Units); and 1.169 hectares of Grassland (5.823 Biodiversity Units) with an average payment per hectare of £87,400.⁵⁰ This sum comprised the offer, bonus derived from the market surplus (under the Lindsay Mechanism) and average lifetime land-use and maintenance cost. Some offers from prospective NBP suppliers did not settle as they were not competitively priced or could not meet requirements from buyers for Biodiversity Units. Speculative offers from NBP suppliers substantially higher than buyer bids were not settled by the market algorithm. Buyer requirements to redeem Biodiversity Units in the short term also meant that fewer Units were available compared to potential increase in Biodiversity Units with maturation of NBPs.

Limitations on habitat types scoring positively under the Biodiversity Metric tool meant that some Projects could not be included: only grassland, scrub and pond projects progressed to the Market Round. A planned agroforestry development was not recognised by the Biodiversity Metric tool, so could not generate tradable environmental units. A further shortfall found in the workings of the Biodiversity Metric tool was that converted habitat registered as a loss, effectively cancelling out gains relating to creation of habitat of higher perceived locally appropriate biodiversity value and better fitting with the wider landscape. This latter finding is consistent with the findings of Cianchi et al.⁵¹ In practice, unless schemes create habitats defined as of higher distinctiveness, and hence high Biodiversity Unit scores, overall gain in score is unlikely.

After MRI settlement, scheme implementation and subsequent annual maintenance and monitoring payments were paid to NBP suppliers in stages over the 30-year term of the agreement, with an inflationary allowance of 3% per year.

Wildlife Trusts were permitted to act as an Investor under the same rules as other buyers, submitting a closed bid but with

viable external buyer bids prioritised over Wildlife Trust investor bids. This was significant in early stages of market development as many prospective buyers were reluctant to invest ahead of BNG requirements becoming mandatory. Wildlife Trusts also retained a right to resell Biodiversity Units under future market rounds to ensure continued market development and operation.

A further important feature of BACM development, supported by grant funding, was skills development. Twelve Kickstart placements were initially planned although only five were secured by scheme end of March 2022. However, the BACM project team developed a new six-month ecology placement scheme that upskilled and trained six trainees, all subsequently securing roles as Assistant Ecologists after the traineeships ended in January 2023, with a further two ecology trainees completing placements ending February 2024.⁵²

Iterative learning from MRI informed Market Round Two (MR2). Biodiversity Units purchased by Wildlife Trusts under MRI as 'buyers of last resort' were permitted to be sold following BNG becoming mandatory, though in practice none were sold in MR2. EOIs for MR2 opened in Autumn 2023, with subsequent Registration by prospective NBP suppliers and Credit Requirement Registration from buyers running from 27th November to 9th December. After development of a COS, Offers and Bids were submitted by February 12th, with Market Settlement following this deadline.

It is regrettable that UK government deferred mandatory BNG until beyond the MR2 window, creating uncertainty and suppressing buyer interest also meaning that LPAs still had no formal role in approval of biodiversity units. Nonetheless, the Market Operator, supported by the Wildlife Trusts, spent significant time engaging with LPAs to ensure that LPAs understood and accepted the accreditation processes, and would accept Biodiversity Units purchased through the market for the purpose of mitigation. Biodiversity Metric assessments conducted by Wiltshire Wildlife Trust and signed off by two ecologists in the Trust formed a central part of a package of information, including a pre-market review and all associated documents, submitted to LPAs in early market development rounds. This proactive effort was necessary to build confidence. Iterative updates to the Biodiversity Metric tool during the market round added further complexity.

Annual maintenance and monitoring payments for settled NBPs were modified for MR2, providing annual payments for five years then, if compliant, payment of the remaining 25 years of annual payments as a lump payment. The inflationary allowance for maintenance and monitoring payments for BNG schemes was also revised for MR2 to 5% per year up to year 5, followed by a lump payment for the remainder of the 30-year time horizon.

Under the Biodiversity Metric tool, the cost of Biodiversity Units to buyers is potentially increased by distance from the registered

NBPs (offsite mitigation) due to the application of a Spatial Risk Multiplier (SRM). Under Version 4.0 of the Biodiversity Metric tool: Buyers incur no penalty for registered NBPs within the same LPA; an SRM of 0.75 is applied if the buyer is in a neighbouring LPA; and a 0.50 SRM is applied for buyers more remotely. When applied within BACM, this results in an increased cost for Biodiversity Units generated within one LPA but sold to a Buyer in another LPA. Thus, a penalty is applied to the developer causing the habitat loss, and not to the Supplier of the NBP. This has the benefit of driving mitigation locally to the proposed development, though it may reduce the demand for units aggregated over broader areas beyond LPA boundaries. The impact of the SRM can be offset by developing NBPs within Areas of Strategic Significance, to be identified by LPAs in Local Nature Recovery Strategies in 2024 (for example Kent Country Council).⁵³ In a market context, it is expected that this will drive supply within Areas of Strategic Significance, optimally benefiting landscape-scale nature recovery in these ecologically important areas.

Discussion

Key questions posed for this study are how well the still-emerging BACM met its stated purpose of creating a market to deliver local, high-impact and verified projects to establish a world-leading approach to nature recovery and delivery of a range of environmental services in ways that are simultaneously beneficial to landholders, businesses and the environment. Successes, innovations and limitations are addressed leading to recommendations for further development not only of the BACM but of wider catchment-based and other nature-based markets.

4.1 Successes of the BACM

Despite the ambitious timeline of BACM development GRCF-funded to March 2023, with extension to June 2023, in addition to limitations imposed by the effectiveness of the Biodiversity Metric for differing habitat types and services and belated guidance on stacking and other factors, MRI was settled successfully (with MR2 settlement pending at the time this report was written). BACM MRI became the first online biodiversity market in the UK to simultaneously settle multiple trades. It was also the first initiative in the world to apply a two-sided market, intended to facilitate sale of multiple environmental services, though in practice limited to Biodiversity Units, demonstrating the effectiveness of the Lindsay Mechanism. GRCF funding supported establishment of 26 hectares of agroforestry and 25 hectares of woodland, scrub, grassland and wetland habitat, and supported six ecology trainees who were then employed as Assistant Ecologists.⁵² These gains were not part of MRI, which resulted in a more modest settlement funding 1.426 hectares of habitat enhancement projects supplying 7.137 biodiversity units comprising,⁵⁰ though this early BACM pilot demonstrated the operability of the market mechanism.

4.2 Outcomes for nature and people

From the buyer perspective, positive outcomes for nature were secured through multiple routes. Assurances required from buyers under the EBF included explicit and evidenced commitments to buyers improving their ecological footprint over time, the use of environmental units purchased to drive genuine environmental improvements, a public commitment to striving to achieve net zero, and an agreement not to resell environmental units. As a prequalification for market entry, buyers were also required to declare that they were not participating in environmentally damaging or socially unacceptable activities.

NBP suppliers were also required (non-binding at EOI stage) to ensure that proposed sites were not awaiting planning permission, to have undertaken checks to avoid heritage, archaeological or habitat damage, that plans were in line with local nature recovery strategies, and that the land would be covenanted for a 30-year term to secure biodiversity gain.

BACM design also provided a range of linked socio-economic benefits. One of the required strands of project funded under GRCF was “Connecting people with nature”, favouring projects creating or retaining jobs and creating opportunities and benefits for all ages. Additional co-funding from the Kickstart Scheme with scheme extension supported by Wessex Water aimed at creating jobs for young people receiving Universal Credit; although only five of the planned 12 Kickstart placements were filled, the project team developed a new six-month ecology placement programme upskilling and training six trainees all of whom subsequently secured roles as assistant ecologists after the traineeships ended in January 2023.⁵⁴

Bounding the market on a natural catchment boundary also created local benefits by localising investment, and by recirculating a proportion of profit generated by businesses (or potentially investment in policy implementation by the public sector) into enhanced local socio-ecological resilience. This community-building aspect can form part of a transition in societal values.

The linkage of biodiversity and ecosystem service outcomes with socio-economic benefits in BACM scheme design is largely in line with evolving conceptions of PES to integrate stronger valuation of nature, the development needs of rural communities, creation or engagement of relevant institutions, and dialogue about distribution of benefit.¹¹

4.3 Factors underpinning successes of the BACM

To achieve its outcomes, BACM established robust operating principles to secure a fair, secure and long-term deal for landholders rewarded for delivering NBPs on their land.

Establishment of a two-sided market was significant in averting the need for buyers to enter into long-term payment contracts directly with NBP suppliers, with the Market Operator assuming risks entailed in determining likely environmental unit generation from NBPs. Aggregation of Biodiversity Units from multiple NBPs through the market mechanism ensured that buyers were not dissuaded by a need to make purchases from disparate small

projects each requiring modest funding. Aggregation reduced overall transaction costs, and addressed the heterogeneity of landscapes within which projects were proposed with a different balance of likely units across different ecosystem services.

Investment in an automated market settlement process, utilising the Lindsay Mechanism to share surpluses fairly between buyers and NBP suppliers, was significant in gaining buyer and supplier trust, averting underbidding by buyers and inflation of proposed costs by suppliers, and preventing unintended Market Operator bias in settlement.

High levels of qualification and assurance of accepted NBPs and buyer qualification was supported by robust processes, including development of template contracts and establishment of transparent Environmental Market Rules and a robust governance framework. This contributed to high-impact and verified projects being funded under transparent and legally binding markets. Relevant assurance schemes included:

- Requirements on buyers of Biodiversity Units to demonstrate environmental leadership under the bespoke EBF at EOI stage as a precondition of participation in the market;
- Formalisation of Nature Based Project Agreements (NBPAs) for providers of NBPs;
- Legally robust framework contracts for both suppliers and buyers to ensure rigour and transparency of lifetime agreements with the Market Operator;
- Review of designed NBPs, and the Biodiversity Units they are calculated to generate, by Wildlife Trusts with accreditation of these Units by the Market Operator (EnTrade);
- The rules-based, automated market settlement process founded on the Lindsay Mechanism avoiding operator bias at the settlement phase, optimising matching of units generated by NBPs with buyer requirements, and offering prospective buyers and suppliers confidence about fair sharing of surpluses;
- Provision of comprehensive data, including Biodiversity Unit calculations and all relevant contracts, provided by the BACM team to LPAs in advance of BNG becoming mandatory, at which point LPAs take on this verification role. Buyer verification will nonetheless still be required when Units are purchased to fulfil non-statutory purposes; and
- Oversight and governance provided by the independent Environmental Markets Board.

Government and private support for the BACM, including for extensions driven by both unanticipated delays and by successes achieved in MRI within limitations, was essential for initial robust

market development. This demonstrates that substantial initial investment is required to established novel catchment-based and nature-based markets.

Permission from Defra for Wildlife Trusts to enter legal agreements with the Market Operator to act as ‘investors of last resort’, holding rights to environmental units matching Wildlife Trust bids settled according to the Lindsay Mechanism, enabled early rounds of the market to settle successfully in the event of fewer buyer bids being received than initially anticipated.

The BACM also successfully built environmental improvements and human capacity, settling habitat enhancements within a pilot market whilst simultaneously upskilling Kickstart placements and ecology trainees.

4.4 Limitations in early implementation of the BACM

Buyer confidence in early market rounds was dampened by delays in BNG becoming mandatory, and by political dithering about nutrient neutrality markets. Settlement therefore necessitated purchase of some Biodiversity Units by participating Wildlife Trusts as ‘investors of last resort’. Total Biodiversity Units purchased by the Wildlife Trusts and the identity of buyers is kept confidential by the Market Operator due to the small size of the market, risking exposure of costings/bid information. As investors, the Wildlife Trusts were not allowed to fund their own NBPs through the market. This limitation will be relieved for future market rounds, as BNG became mandatory in England with updated supporting guidance in February 2024.

The market was limited to Biodiversity Units in early development market rounds, and limitations of the Biodiversity Metric tool further limited qualifying habitat types. Difficulties with quantification and government guidance that stacking of biodiversity with carbon services was not permissible also prevented marketing of units for a broader range of benefits flowing from projects including, for example, carbon sequestration, nutrient mitigation or flood regulation, unfortunately denying scheme providers the opportunity for multiple income streams from their habitat enhancement interventions.

Clarity is also required from government about rules for stacking public funding with additional private finances, and implications for landowners for inheritance of covenanted land.

4.5 The ‘nature-based’ test

This paper’s Introduction highlighted how purported nature-based markets were often historically developed under narrow

neoclassical grounds, predicated on maximising outputs of single ecosystem services whilst overlooking ramifications for the socioecological system as a whole. It is vital to prevent narrow neoclassical market capture in the development of novel ecosystem-based markets, for example carbon storage using alien tree species which can exert a diversity of both positive and negative impacts on different ecosystem services (such as biodiversity, landscape quality, water yield, erosion protection and carbon storage) at catchment scale.⁵⁵ Multiple examples exist of the novel language of NBSs and ecosystem services – both inherently systemic framings – being applied on a non-systemic basis, hence perpetuating historic market failures through maximisation of single outcomes yet undermining ecosystem structure, integrity, functioning, resilience and benefit provision across a full range of ecosystem services.²¹

Novel, high-integrity nature-based markets, and also nature-based policy development, must necessarily embody a systemic approach when assessing the outcomes of interventions. At present, the BACM model makes progress towards this aspiration through a central focus on nature's recovery as the ecological foundation for generation of potentially marketable ecosystem services. The BACM also seeks to address multiple ecosystem services, albeit that only limited markets for Biodiversity Units were possible under MRI and MR2. Filters on scheme acceptability based on heritage, archaeological and nature conservation implications also implicitly address some additional ecosystem services. This does not yet fully embody a systemic assessment, both to avert unintended negative outcomes for overlooked services but also to identify co-beneficial outcomes through modified scheme design. However, it does represent incremental progress towards reframing desired ecosystem service enhancements (in this case a novel market for them) as 'anchor services', around which optimisation of systemic co-benefits stemming from enhancement of supporting ecosystem quality and functioning⁵⁶ as a linked 'bundle' cumulatively providing greater ecological and societal benefits.^{57,58}

The need for rapid but transparent and replicable systemic screening has been recognised by the Ramsar Commission (on wetlands of international importance). This led to innovation of the RAWES (Rapid Assessment of Wetland Ecosystem Services) approach, adopted by Resolution XII.17 of the Ramsar Commission (2018),⁵⁹ as a rapid and cost-effective, internationally standard method for systematic assessment of ecosystem services provided by wetlands. RAWES addresses the key operational need for a genuinely rapid assessment approach recognising practical time and resource limitations faced by operational staff.^{60,61} It achieves this by taking a transparent, semi-quantitative approach to rapidly screen systemic implications, avoiding the divisive outcomes of data-heavy and monetised approaches that marginalise hard-to-quantify services, enabling instead integration of quantitative with qualitative, literature, field survey

and traditional knowledges.⁶² RAWES is relevant to, and has been widely applied in, ecosystem types beyond wetlands. It is recommended that further development of BACM and other catchment-based markets should include a high-level systemic screening approach (exemplified here by RAWES) to ensure that wider ramifications of emergent markets are made transparent. This form of systemic recognition of ramifications for a broad suite of ecosystem services and their associated beneficiaries is missing from some novel purported nature-based market mechanisms such as the IUCN Peatland Code for the UK,⁶³ which is singly focused on independently verified potential for carbon accretion (albeit with some regard for preservation of both designated and undesignated heritage assets as constraints and opportunities) principally through revegetation or rewetting with associated maintenance for a duration at a minimum of 30 years.

4.6 Scheme viability and further development

Grant funding from multiple sources proved essential for BACM evolution and pilot delivery. In the absence of core grant funding, all costs associated with catchment markets are intended to be borne by the demand side, environmental unit prices reflecting associated costs (project settlement, governance fees, operation, monitoring and a compliance fund for the LPA).

Roll-out of the BACM also confirmed that a compelling or enabling policy environment is essential for successful markets. MRI and MR2 were limited to Biodiversity Units only owing to uncertainties and limitations on stacking with other markets, and buyer engagement was inhibited by delays in BNG becoming a statutory requirement only after MRI and MR2 settlement. This was further compounded by limitations in the Biodiversity Metric tool: three iterations of the tool with differing metrics were in place during MRI and MR2 implementation. Stability and unambiguity in the policy framework is essential to give buyers and scheme providers sufficient confidence to commit to market engagement.

No financial service licencing was required by the Market Operator during pilot BACM implementation. However, the Market Operator is exploring options to allow external investors into future markets, with the caveat that they would always have to resell back through the market and only ever to buyers with a regulatory need rather than opening purchasing to other investors. This is necessary as buyers of environmental units, such as developers, might purchase units that they then find exceed requirements for their submitted plans, necessitating resale back through the market.

Conclusions and recommendations

Key learnings from BACM development and the first two Market Rounds, including areas for further development of nature-based markets both in the Bristol Avon catchment and generically/internationally, include:

- The operability, integrity and transparency of the catchment market has been proven in principle, culminating in settlement with generation and sharing of surplus albeit with limited numbers of buyers and restrictions to a single service (Biodiversity Units).
- This proof of principle within an operational 'real world' market can form a basis for further market development and diversification, and establishment of further free-standing, self-sustaining markets. This can serve to accelerate flows of private finance into nature recovery, climate change and wider systemic benefits.
- BACM design includes a strong emphasis on nature recovery, prioritised as a primary capital generating desirable ecosystem services and underpinning future security and opportunity. It is essential that all 'nature-based' markets, initiatives and policies genuinely have nature at their base underpinning a paradigmatic change towards a regenerative approach to enhance primary natural capacity as a basis for generating desired services, rather than focusing on narrow exploitation of single services blind to wider ramifications as is the norm in current neoliberal markets.
- The BACM also developed outcomes for people including: landowners rewarded for enhancement of nature; beneficiaries of enhanced ecosystem services; and direct upskilling of those employed or trained in BACM development. Social outcomes should be integral to all nature-based markets.
- The policy environment has a major bearing on confidence for providers and buyers to enter markets. The unfortunate slippage of BNG becoming statutory during MRI and MR2, and late publication of guidance and shifting political agendas for example about nutrient neutrality, proved to be disincentives for market entry.
- Tying land into potentially intergenerational agreements proved unpopular with landowners, presenting an obstacle to some scheme providers converting their EOs into formal submissions.
- Mechanisms within the BACM design, such as the EBF, the ECSA and independent verification, with oversight by an independent Environmental Markets Board, focus on wider outcomes for nature and associated services. Whilst this does not go to the full extent of a RAWES-type semi-quantitative screening of ramifications for all ecosystem services and their beneficiaries, it does demonstrate a focus on the importance of the service-providing ecosystem. This averts market development focused just on narrow service outcomes, blind to wider systemic ramifications. Recognition of full systemic ramifications needs to be enhanced and made more transparent by integrating a rapid systemic screening stage into the market model to guard against unintended negative outcomes, and to optimise potential net societal benefits from traded solutions.
- The role of a robust Market Operator was crucial for the success of the BACM, establishing and maintaining rigorous 'rules' and support processes – significantly including the automated settlement algorithm based on the Lindsay Mechanism – with regard to the emerging statutory system. As the Market Operator cannot govern itself, oversight by an Independent Environmental Board is also crucial.
- There is a need to refine supporting tools, significantly including the Biodiversity Metric at the state of development underpinning MRI and MR2, better to reflect wider benefits for nature and people. The Biodiversity Metric tool needs modification to work better on improvements to land of moderate or good quality, rather than just improvements and habitat diversification on non-yielding or poorly performing landholdings, as well as better addressing woodland settings. Ideally, a robust accreditation protocol (such as an ISO or BSI standard) would underpin consistent assessment of schemes aiding transparent assessment by LPAs and other partners, which currently rely on a less formal evidence base.
- There is still a lack of integration within a consolidated market offering of multiple services such as nutrient, carbon and flood regulation, aesthetics and recreation, and soil formation. Obstacles to the bundling or stacking of services need to be overcome to maximise returns for scheme providers and further promote nature enhancement. An additional requirement enabling this is to reform legacy regulations framed on a narrow disciplinary basis, taking instead a systemic ecosystem-based approach.
- Greater consideration is required concerning issues of 'leakage' (displacement of damage to other locations) and 'additionality' (payments for actions over-and-above those which land or resource managers would generally be

expected to undertake), addressed in the 2013 Defra PES Design Guide.⁶⁴ This is currently lacking in market support tools such as the Biodiversity Metric and the IUCN Peatland Code for the UK.

- Close co-development with other novel initiatives in this area (such as the Land App, further development of RAWES, novel catchment-based Flood Insurance models, Catchment-Sensitive Farming (CSF), etc.) will add further rigour and consistency with other emerging market and regulatory models.
- Clarity about language emerged as important. Less specific terms such as 'buyers' and 'sellers' presented an obstacle, overcome by dialogue and engagement to build trust sufficiently to establish the market. Continued consistency of language, clarity and common understanding between partners is required in development of all future nature-based markets.
- It is essential that principles developed are apolitical, operable under political paradigms different to current dominant neoclassical norms. In a more socially and/or environmentally based political regime, regulatory or fiscal measures may more directly reflect the values of nature rather than relying on acceleration of private finance markets. A consistent focus on underlying principles provides robustness and adaptability to governance assumptions and execution.
- Under future evolution, it is conceivable that BACM could develop an investment model wherein investors purchase the Rights to Biodiversity Units, either as a voluntary investment or for future resale, enabling suppliers under the BACM to receive a secure long-term income for their NBPs. Development work is required to ensure supply of units is maintained for regulatory buyers first and foremost, and that inflation of unit pricing is not detrimental to overall contribution towards nature's recovery.
- Though far from perfect or fully evolved, the BACM represents a model for further roll-out and development to new catchment-based, nature-based, PES and PES-like markets – nationally and internationally – generating value-for-money for its participants and a wealth of lessons relevant to wider nature-based market development.

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Annex: Biodiversity Net Gain (BNG) and the Defra Biodiversity Metric tool

Biodiversity Net Gain (BNG) was introduced under the England's Environment Act 2021, requiring all planning permissions granted in England (with a few exemptions) to deliver at least 10% BNG. The wider aim of BNG is that 'Mandating biodiversity net gain could ensure that new development enhances the environment, contributes to our ecological networks and conserves our precious landscapes'.⁶⁵ The intent is to extend beyond enhancement of biodiversity, also including a mix of biodiversity, ecosystem services and natural capital pressures.⁶⁵ However, while biodiversity is critical to the functioning of ecosystems and the services they provide,^{7,66} the association between biodiversity and ecosystem services is multi-layered and cannot be automatically assumed.⁶⁷ BNG became statutory in February 2024.

The Defra Biodiversity Metric tool was developed to measure BNG. Qualifying habitats are secured for at least 30 years. The Biodiversity Metric tool, of which there have been iterative versions, uses broad habitat features as an approximate measure for estimating the value of BNG on a site. The Biodiversity Metric tool penalises the value of habitat creation proportionately with distance from the development site.

The proponent undertakes preliminary ecological appraisal of the land intended to develop Biodiversity Units, along with development of a 30-year management plan to uplift biodiversity and a draft legal agreement (under Section 39 of the Wildlife and Countryside Act) that covenants the landowner and successors to a 30-year agreement ensuring creation of net gain. Normally, the landowner would be expected to meet Market Operator fees as well as any necessary independent legal and financial advice, though these were substantially covered by grant funding under BACM MRI.

LPA consents for a development requiring BNG are implemented as a condition of planning consent or under Section 106 of the Town and Country Planning Act, triggering potential purchase of accredited Biodiversity Units off-site. This does not abrogate a responsibility to avert biodiversity damage on-site. Legal fees for this purchase and supporting agreement are borne by the developer.

Version 4.0 of the Biodiversity Metric was used in BACM MRI. This version takes only limited account of implications beyond the redline boundary of assessed sites, limiting consideration of both scale and heterogeneity of habitat, both of which are crucial for biodiversity,^{68,69} ecosystem functioning/services and resilience.^{70,71,72} Version 4.0 also fails to assimilate local context-specific data from outside the redline boundary of assessed sites.

One case study site found a net reduction in habitat units when planning based on guidance for habitat enhancement specifically requested by Natural England (the natural environment regulator in England) to improve the connectivity and buffering of an important local wildlife site – the proposal incorporating more scrub, increasing the structural complexity including installation of small ponds – effectively decremented BNG score by conversion of pre-existing grassland.⁵¹

The Biodiversity Metric tool recognises that the number of Biodiversity Units will rise as habitat improvements mature. However, the number of Units that a habitat enhancement scheme generates is fixed at the point the buyer links them to a planning application, rather than representing an investment of increasing value as the schemes mature. Hypothetically, buyers could forward-plan for increasing Biodiversity Units though, in practice, potential longer-term values are not realised in the development phases of the BACM as buyers had looked to purchase Biodiversity Units to meet their immediate needs. Consequently, the level of Biodiversity Units generated is crystallised at the point at which they are formally assigned to development schemes.

Under the longer-term roll-out of BNG, investors will be allowed into the market to invest in rights to environmental units that can increase in value as nature-based projects mature with an increase in Biodiversity Units. The value of units can also increase with demand competition, which is considered likely to occur once BNG becomes established. The benefits of this potential 'futures' market is that habitat enhancements are put in place immediately. It is though likely that this 'futures' aspect may fall under Financial Conduct Authority (FCA) rules.

Further concerns expressed by landowners currently include uncertain implications for inheritance of covenanted land, as well as the stacking of private payments with public funding. This emphasises the need for clarity to emerge from the still-obscure policy environment.

A major concern arising from application of BNG in BACM MRI and MR2 is that it undervalues, or does not value, water-based habitats. Furthermore, whilst the Biodiversity Metric has evolved through a series of iterations, the version supporting statutory implementation of BNG reduces the value of 'very high distinctive' and 'high distinctiveness' sites relative to earlier versions of the Biodiversity Metric tool. Whilst this accelerates implementation and reduces risk with more Biodiversity Units

generated immediately – for example, favouring grassland schemes – the potential to fund the most ecologically beneficial habitat projects such as water, wetland and woodland creation or enhancement is prejudiced by timeline to scheme maturity and associated increase in Biodiversity Units at point of trading and/or redemption. This goes against the purpose of the BNG to create or improve habitat for nature. Whether LPAs accept that submitted projects offering the quickest returns of Biodiversity Units are optimal for nature, and assert that this is a key facet of implementation of BNG in ensuring a high level of biodiversity gain and integrity in emerging markets, is yet to be tested.



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