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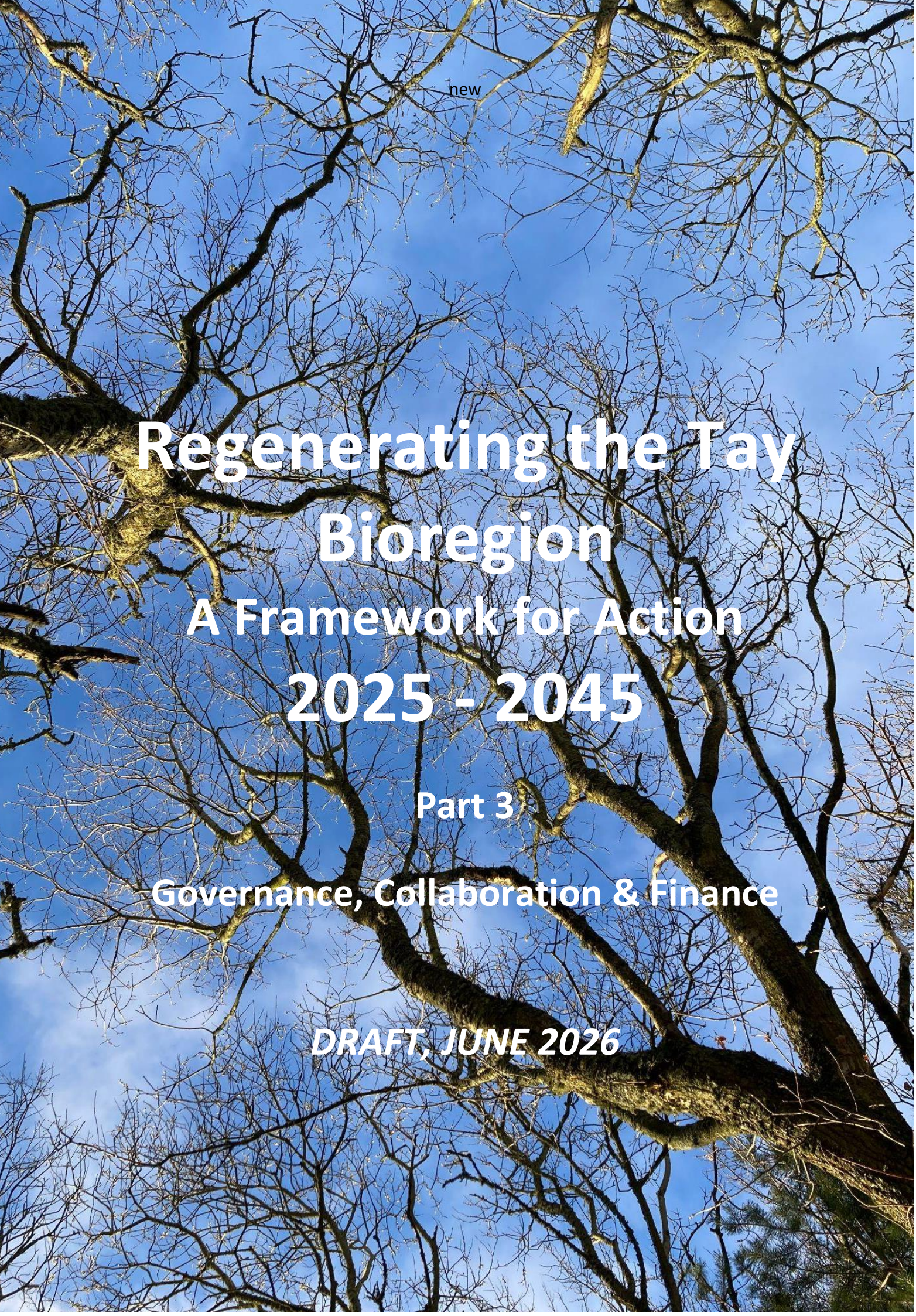


Regenerating the Tay Bioregion

A Framework for Action

2025 - 2045

Part 3

Governance, Collaboration & Finance

DRAFT, JUNE 2026

Part 1: Learn About The Tay Bioregion & Assessment of the Health of the Tay Bioregion in 2025

Part 2: Opportunity Analysis & Strategic Directions

Part 3: Governance, Collaboration & Finance

Part 3

Governance, Collaboration & Finance

Contents

1. Executive Summary

Part 3 of the *Framework for Action For The Tay Bioregion* sets out the organisational architecture, collaborative structures, and financial mechanisms required to deliver a regenerative, resilient future for the Tay Bioregion.

It recognises that transformational change demands not only new projects and new investments, but new ways of organising power, knowledge, decision-making, and resource flows.

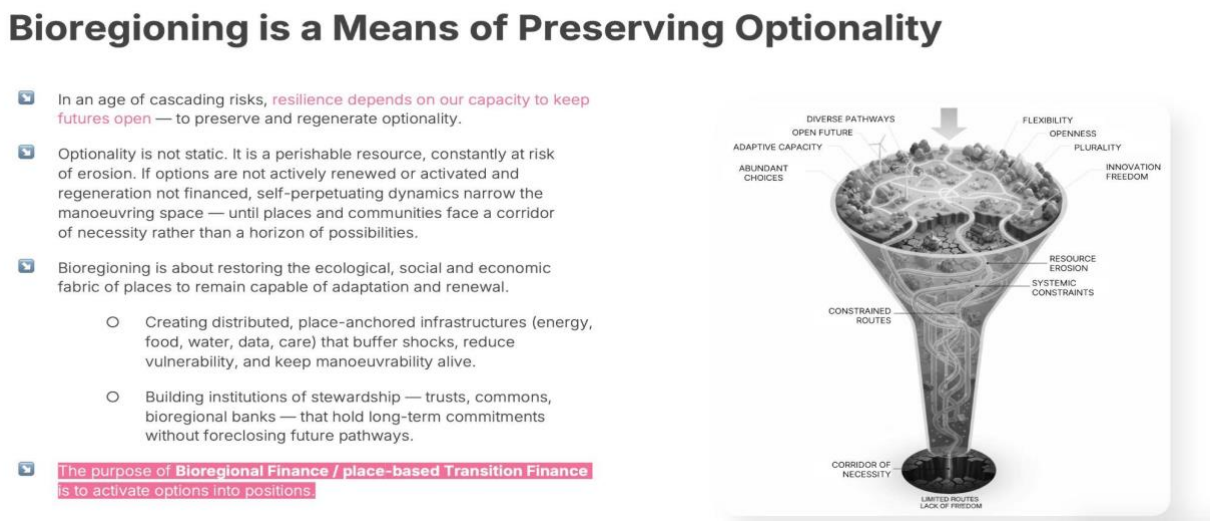
Underpinning this Framework is the recognition that the Tay Bioregion itself is a shared commons: a living system whose ecological processes, cultural memory, knowledge, relationships and productive capacities require collective stewardship.

The purpose of governance is therefore not simply to administer projects, but to maintain and regenerate the conditions that allow the Bioregion to continually renew itself. Governance is treated not as an administrative function but as a living system: polycentric, participatory, adaptive, and grounded in the ecological and cultural reality of place.

This section introduces a proposal for five mutually reinforcing bodies - Bioregioning Tayside, the Bioregional Financing Facility, Bioregional Catchment Trusts, the Bioregional Observatory, and the Bioregional Learning Network - each contributing to a coherent bioregional governance ecosystem capable of stewarding long-term regeneration.

Bioregional Governance: From Control to Collective Stewardship

The dominant governance models within government, business, and many third-sector organisations remain shaped by enclosure, hierarchy, and control. These structures struggle to respond to complexity, interdependence, and climate uncertainty. Bioregioning Tayside proposes a different orientation: governance that distributes authority, centres care and trust, and builds “power-with” rather than “power-over” infrastructures. This requires polycentric arrangements in which many actors hold autonomy within shared purpose, enabling self-organisation, mutual accountability, and continuous feedback.

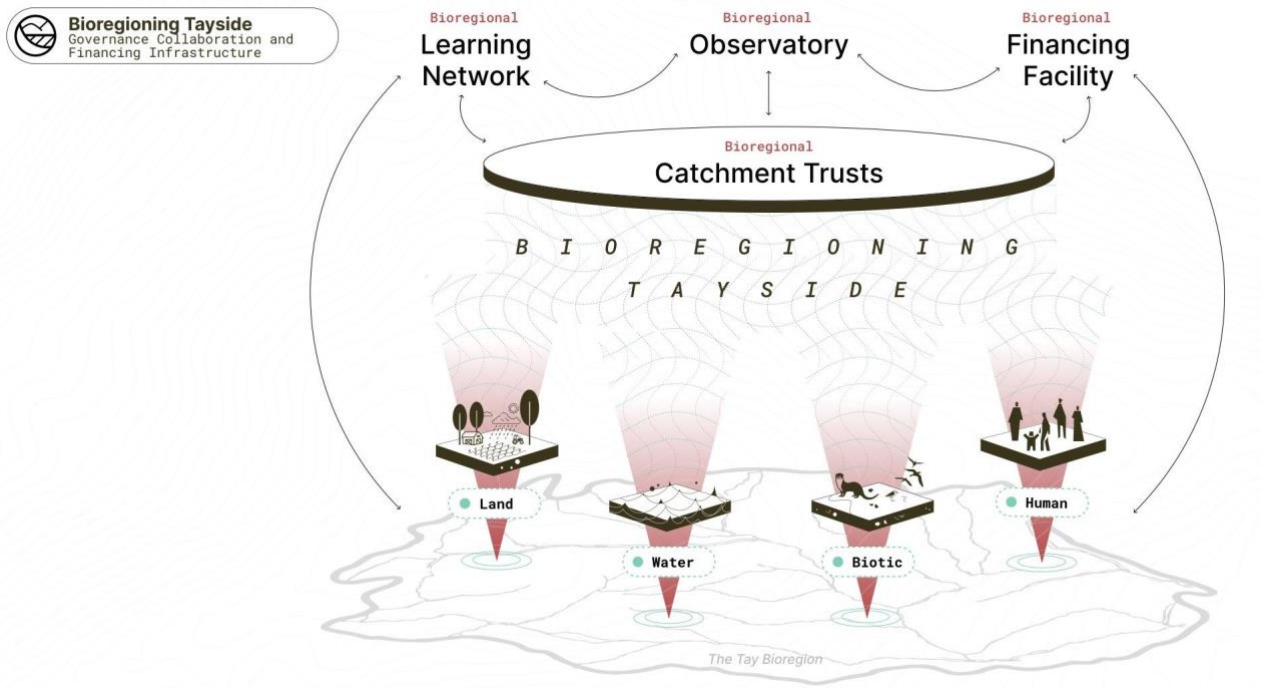


Graphic, Dark Matter Labs

A key concept underpinning this shift is extitutional organising - organisations that operate *between and across* existing institutions, rather than replacing them. These “membrane” or “network organisations” are simultaneously permeable and selective, enabling coordination and knowledge flow without centralising control. They hold coherence across the system while allowing autonomy to flourish at local scales. This architecture reflects the behaviour of living systems, in which nested networks, distributed sensing, and adaptive learning combine to create resilience.

Five Interconnected Governance and Finance Bodies

To deliver the Framework for Action, five new or emerging institutional forms are proposed. Each fulfils a distinct role while contributing to an integrated governance ecosystem.



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1. Bioregioning Tayside (BT)

Bioregioning Tayside (BT) is the Bioregion's intermediary organisation and the first body to be established. As a Community Interest Company created in 2022, it cultivates the enabling conditions for systems change by convening stakeholders, building shared narratives, and supporting collaborative innovation. Its work is relational, developmental, and catalytic focused on shaping the ecosystem within which regeneration can take place.

BT’s Vision is *a flourishing and resilient Tayside Bioregion based on care for the natural world and each other*. Its values emphasise relationality, ecological belonging, long-term stewardship, inclusion, and intergenerational responsibility. Its Theory of Change places land, water, and people at the centre: sensing, sensemaking, collaboration, experimentation, resourcing, and continuous learning form cyclical pathways for change.

BT’s strategic focus includes eliminating system degradation of all kinds, safeguarding natural and cultural assets, innovating for resilience, enhancing community self-determination, and strengthening

whole-system vitality. Across Tayside, BT collaborates with communities, landowners, government, researchers, funders, practitioners, creative organisations, and enterprises to make these principles actionable. A number of open questions remain concerning BT's future governance, accountability, relationships with existing and emerging bodies, and long-term resourcing.

2. The Bioregional Financing Facility (BFF)

The Bioregional Financing Facility (BFF) establishes a new financial architecture designed to unlock long-term finance into ecological restoration, community resilience, and regenerative economic transition. It responds to two systemic failures in current regenerative finance: (1) an overreliance on commodified carbon and biodiversity markets, and (2) siloed, project-based funding that seldom addresses underlying system dynamics.

The BFF is grounded in a multi-value worldview that recognises ecological health, social cohesion, cultural vitality, and human wellbeing as interdependent forms of value. It assembles a diverse capital stack - from micro-giving to grants, tithes, debt, equity, and public, institutional and philanthropic investment - and matches each form of capital to appropriate levels of risk, time horizon, and expected outcomes.

Crucially, the BFF designs systemic, interdependent portfolios rather than isolated projects. These portfolios operate across multiple leverage points - land use, water systems, livelihoods, biodiversity, and cultural regeneration - creating conditions for emergent, compounding impact. The BFF partners with communities, individuals, researchers, funders, government agencies, private enterprises, and cultural institutions to shape investment logic, share risks, and steward resources in ways that serve the bioregion as a whole.

Key questions include representation, decision-making, metric design, data transparency, equity in capital allocation, risk and benefits, and how to embed cultural and ecological values alongside financial ones.

3. Bioregional Catchment Trusts (CTs)

Catchment Trusts (CTs) are the most localised governance bodies in the proposed Bioregion-wide architecture. They coordinate regeneration within specific watersheds, acting as participatory governance nodes that represent residents, land managers, and communities of place and interest. Their functions include:

- Local stewardship: co-designing projects for soil restoration, river health, biodiversity recovery, circular economy practices, and community resilience.
- Participatory governance: facilitating assemblies or councils that shape priorities and decisions.
- Local intelligence: providing fine-grained ecological, scientific, social, and cultural insight.
- Finance mobilisation: partnering with the BFF to create catchment-level portfolios.
- Learning & cultural renewal: collaborating with the Bioregional Learning Network to revive knowledge, memory, and place-based skills.

Their success depends on inclusive representation, strong relationships across the governance ecosystem, clear accountability for financial stewardship, and robust knowledge-sharing. Open questions address governance forms, equity, data stewardship, and cross-catchment coherence.

4. The Bioregional Observatory (BO)

The Bioregional Observatory (BO serves as the Bioregion's intelligence and sense-making hub, integrating ecological scientific, cultural, economic, and social data with participatory interpretation. Its core functions include:

- Creating Bioregional Health Metrics that are systemic, situated, multi-scalar, relational, participatory, and adaptive.
- Operating a comprehensive monitoring system that captures "hard" data (biodiversity, water quality, soil carbon) alongside "warm" data (stories, relationships, cultural signals).
- Hosting collective sense-making forums that integrate scientific, lived, and cultural knowledge.
- Running scenario modelling and stress testing to support anticipatory governance.
- Providing feedback into decision-making processes, particularly for the BFF's investment pathways.

The BO relies on collaboration with communities, land managers, researchers, technical partners, public agencies, and cultural practitioners. Questions still to be resolved include governance, data collection, storage and ethics, representation, and links to other bioregional bodies.

5. The Bioregional Learning Network (BLN)

The Bioregional Learning Network (BLN) is envisioned as a "living school of place," offering holistic, experiential, ecological and culturally grounded learning. It addresses the fragmentation of knowledge and action by creating a Bioregional Curriculum focused on ecological literacy, local history and culture, sustainable living, civic engagement, sense of place, regenerative livelihoods, and ethics.

The BLN's value spans:

- Communities: empowerment, identity, resilience.
- Government & institutions: collaboration, scaling of solutions.
- Enterprises: skills development, innovation, incubation.
- Education & research: interdisciplinary learning, living labs.

Its governance, curriculum design, inclusion strategies, infrastructure, and long-term resourcing require further co-design.

In summary, Part 3 of this *Framework for Action* presents a bold reimagining of governance and finance in service of bioregional regeneration. The proposed architecture - BT, BFF, Catchment Trusts, the BO, and the Learning Network - constitutes a dynamic, interconnected system designed to steward the Tay Bioregion through the complexity of cascading global crises - climate instability, biodiversity loss, economic inequality, and cultural fragmentation and toward ecological and social regeneration. Together, these bodies have the potential to create the organisational, financial, and cultural foundations for a flourishing, resilient Bioregion over the next 20 years and beyond.

2. Foreword & Introduction

Effective governance with achievable finance is at the heart of realising the Framework for Action for the Tay Bioregion. This critical part of the regeneration strategy is being designed as a living system in itself - an evolving, multi-nodal as well as multi-layered and polycentric[1] architecture for decision-making, stewardship, and accountability that can remain flexible and focused amid uncertainty.

Governing Collective Action: the Glue + the Compass (Ingrid Burkett 2024)

Current mainstream governance structures - whether governmental, corporate, or even non-profit - operate through enclosure and control. They stake territorial claims, establish hierarchical authority structures, and require individuals and organisations to submit to centralised decision-making processes.

Bioregioning reconceptualises governance into a polycentric, participatory and adaptive force that centres care, trust, and mutual accountability - replacing **power-over** structures with **power-with** approaches that distribute authority and build collective capacity.

In this sense, governance becomes less about exercising authority and more about increasing the adaptive capacity of the whole Bioregion. Every investment, institution and collaborative process should leave the Tay Bioregion with greater ability to respond to uncertainty than before. Regeneration therefore becomes the continuous expansion of future possibilities rather than the delivery of predetermined outcomes.

For this form of governance to succeed, it must remain deeply grounded in local realities while being able to see and be seen? and sense across systems; its configurations must be rooted in ecosystem-based decision-making, community participation and self-determination; it must be capable of holding long-term purpose while adapting nimbly to complexity and change. In practice, this means governance that is enacted through nested, self-organising networks and groups that anchor decision-making in the ecological and cultural realities of place. For example, a Catchment Trust (see Section 5) might

[1] Having multiple centres of decision-making authority, allowing for decentralised and localised responses.

coordinate regenerative land-use opportunities with other Catchment Trusts across the Bioregion; groups involved in participatory science in the Bioregion could form a new network to feed data into the Bioregional Observatory (see Section 5); an Outcome Holders Alliance could ensure the systemic impact of funding coming through the Bioregional Financing Facility.

Organising and decision-making in Bioregional governance is informed by both lived experience and bioregional intelligence, with embedded feedback loops to support emergent strategy and ongoing course correction. Institutional guardianship functions to protect the integrity of the Framework for Action ensuring that long-term purpose is not sacrificed for short-term gains. This reframing moves action from control to facilitation, hierarchy to networks, and scarcity-driven competition to abundance-based collaboration.

Loch Beanie, in the River Ericht catchment, situated on the edge of peatlands, one of nature's natural filtration systems, photo Markus Stitz

This bioregional coordination requires what has been termed[2] 'extitutional' organising (as opposed to institutional), involving mechanisms that operate alongside and through existing institutions without being captured by their limitations. Extitutions are not anti-institutional but rather post-institutional, recognising both the necessity of working with existing institutional infrastructure and the imperative to transcend its constraints. Extitutions operate through what have been termed "membrane organisations" - organisational forms that facilitate connection and coordination without claiming ownership or control. Like biological membranes, these organisations are simultaneously permeable and selective, allowing and facilitating beneficial flows while filtering out harmful elements. They maintain coherence without rigidity, enabling collective action without sacrificing individual autonomy. An example could be a Food Resilience Co-ordination Network, which doesn't replace existing institutions like farms, local councils, food banks, or logistics companies, but works through them, creating new lines of communication and coordination that those institutions can use - but without being owned or

[2]https://docs.google.com/document/d/1x0r01NO4_-xIUfzle6_9rwJbZxDCNgbu1MBzP7X4ckg/edit?tab=t.0#heading=h.rwljb8e6hzic

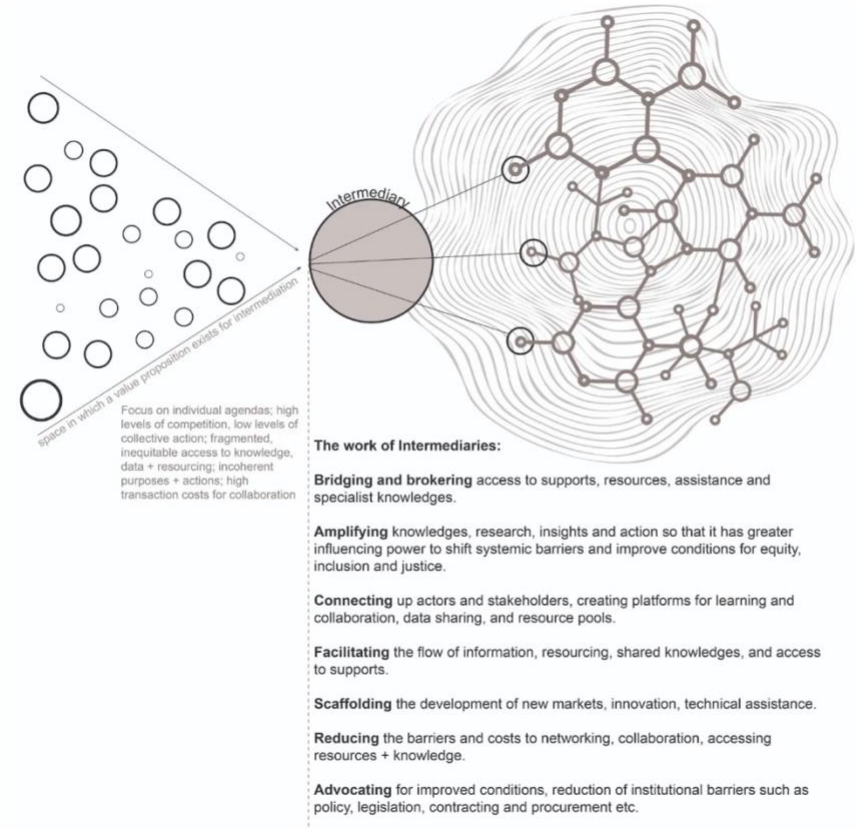
controlled by any one of them. It's lightweight, adaptive, and sits "between and across" formal organisations.

This third part of the Framework for Action outlines the roles of five new forms of organisational and collaborative infrastructure that are being consolidated and envisioned in order to provide a new way of co-ordinating and financing the regenerative action needed across the Bioregion:

- **Bioregioning Tayside CIC:** currently the principal intermediary with the primary role of creating the enabling conditions for systems change.
- **Bioregional Financing Facility:** a new layer in the global financial architecture that drives the decentralisation of financial resource governance, designs project portfolios for systemic change, and brings to life the transition to a regenerative economy at the bioregional scale.
- **Bioregional Catchment Trusts:** the most localised part of the infrastructure, ensuring deep grounding in local realities and constant sensing across systems.
- **Bioregional Observatory:** the Bioregions' intelligence, observation, and sense-making hub.
- **Bioregional Learning Network:** a living school of place, where people of all ages come to learn with, from, and for the Tay Bioregion.

3. Bioregioning Tayside (BT)

Bioregioning Tayside (BT) is the first of the proposed five new forms of organisational infrastructures to have been created.



Framing the Roles of Intermediaries in Shifting Systems (Source: Ingrid Burkett, 2024)

A Community Interest Company, constituted in 2022[3], it is currently the primary resource for co-ordinating regenerative action across the Bioregion and is leading the development of the Bioregional Financing Facility (BFF), Bioregional Catchment Trusts, Bioregional Observatory and Bioregional Learning Network.

Its primary role is to act as an intermediary organisation that cultivates the enabling conditions under which coherent, desirable futures can *emerge* from within the system itself. Intermediaries are entities that can take a variety of forms (e.g. organisations, support services, initiatives or bodies) and are essentially focused on enabling the formation of collaborative ecosystems. In this role, they are usually charged with initiating and/or maintaining infrastructures that support bioregional actors to more effectively work towards transformational agendas.

BT therefore functions less as a delivery organisation than as part of the Bioregion's civic infrastructure. Its purpose is to strengthen relationships, increase coherence between actors, build shared capabilities, and continually improve the operating conditions from which regenerative action can emerge

3.1 Bioregioning Tayside Vision, Values and Theory of Change

3.1.1 Vision

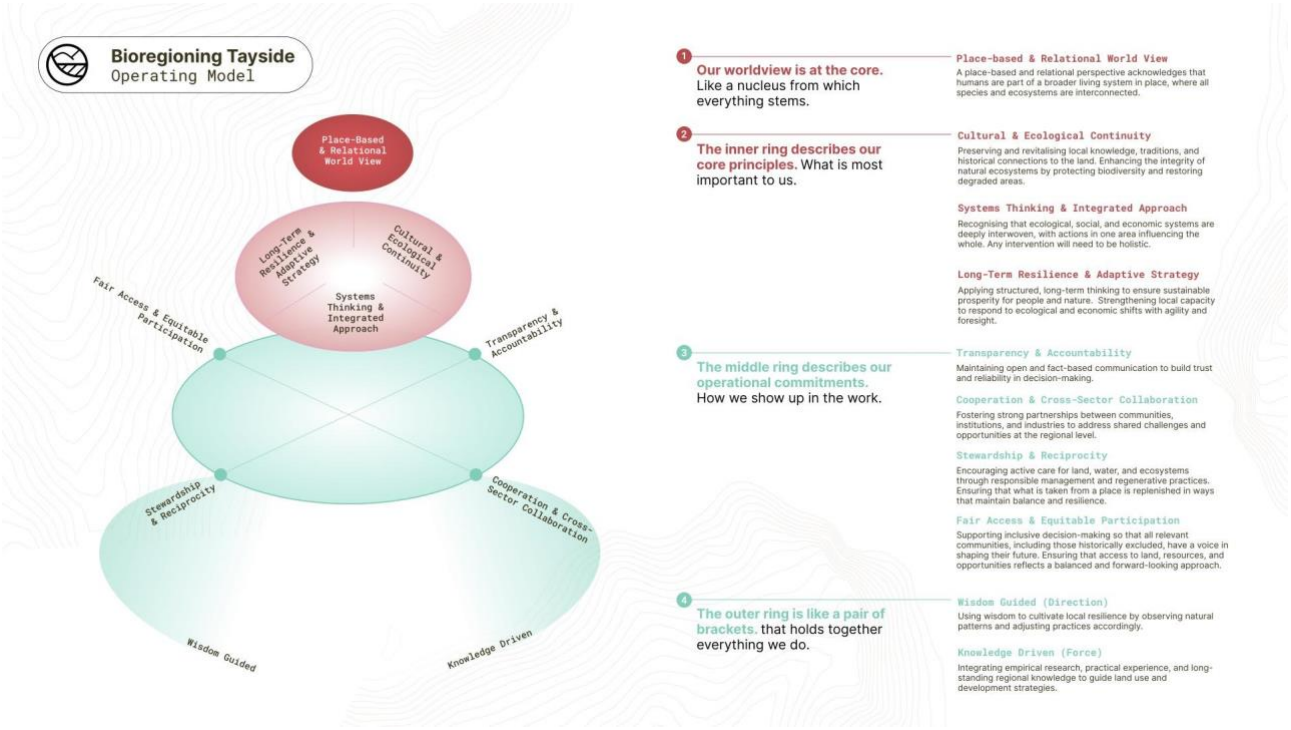
Bioregioning Tayside's vision is "for a flourishing and resilient Tayside Bioregion based on care for the natural world and each other."

3.1.2 Values

For BT, the work begins with its place-based and relational worldview - a deep understanding that people, land, rivers, forests, and wildlife are all threads in the same living fabric. At the heart lies a commitment to see the region as a living system, bound together by relationships, not boundaries. Actions are taken with the awareness that social, ecological, and economic realms are inseparable, and that true prosperity must nurture all three. From this cognitive orientation flow the principles that guide BT's choices.

BT creates the enabling conditions for people to draw on their ecological knowledge, culture and connection to the land, to protect and restore the natural infrastructure on which their lives depend and replenish the skills they will need for the future. Stewardship of the landscape in this place is framed not as an obligation but a form of gratitude - taking only what can be replenished and giving back more than was taken. But stewardship also extends beyond natural assets to include institutions, trust, knowledge, cultural memory and the capacity of communities to organise themselves. These forms of living capital are every bit as important as ecological restoration in enabling long-term resilience.

[3] Company Number **747617**



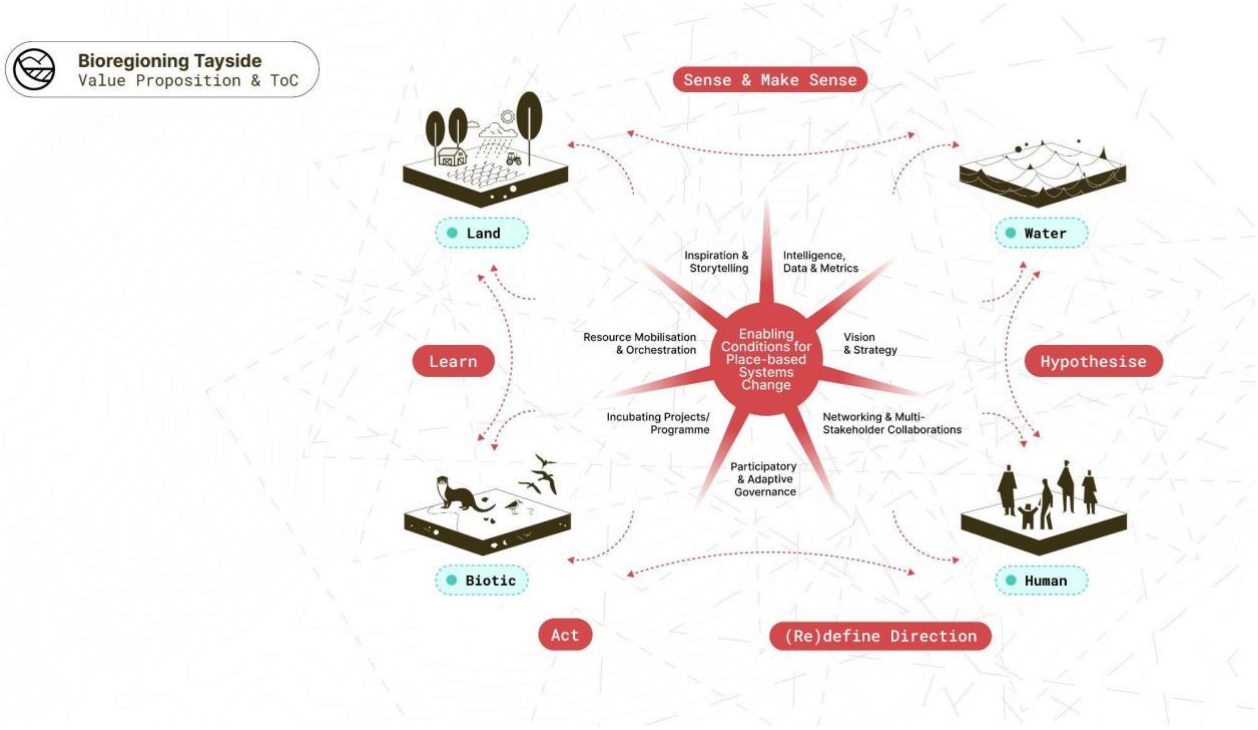
Graphic, Dark Matter Labs

Through this enabling role, partnerships and collaborations bloom across sectors: landowners, managers and scientists work with local communities, learning is inter-generational, and enterprises innovate alongside conservationists. Decisions are transparent, and voices once ignored are brought to the centre, ensuring fairness and inclusion.

This is a place that thinks in generations, not quarters - building resilience to the changing climate, the shifting economy, and the unknowns yet to come. Wisdom guides the direction; knowledge fuels the journey. Together, these form the values for a region intent on thriving in harmony with its place in the world.

3.1.3 Theory of Change

Bioregioning Tayside's Theory of Change places the land, water, people, and living systems of Tayside at the heart of transformation. By sensing and making sense of what's happening in our bioregion, we can generate shared insights and bold visions. Through collaboration, storytelling, and data, we hypothesise new possibilities and incubate projects that bring them to life. Acting together, we mobilise resources and strengthen governance, learning from what works and refining direction as we go. This cyclical process unlocks the potential for place-based systems change - building a resilient, regenerative future for all life in Tayside.



Graphic, Dark Matter Labs

3.2 Bioregioning Tayside Strategic Focus

Bioregioning is the active, ongoing practice of reinhabiting place[4] - learning to live in ways that are deeply attuned to the ecological, cultural, and historical realities of a bioregion. It's about becoming native to a place through attention, relationship, and reciprocity.

Bioregioning involves weaving together community, ecology, and economy at a scale that makes resilience and regeneration possible.

It is both repair and reimagination - tending to the wounds of disconnection and extraction, while also co-creating futures rooted in mutual care between human and more-than-human communities.

It helps people re-root themselves in the rhythms and limits of their environment, fostering a sense of belonging and shared responsibility for the health of both human and other than human life.

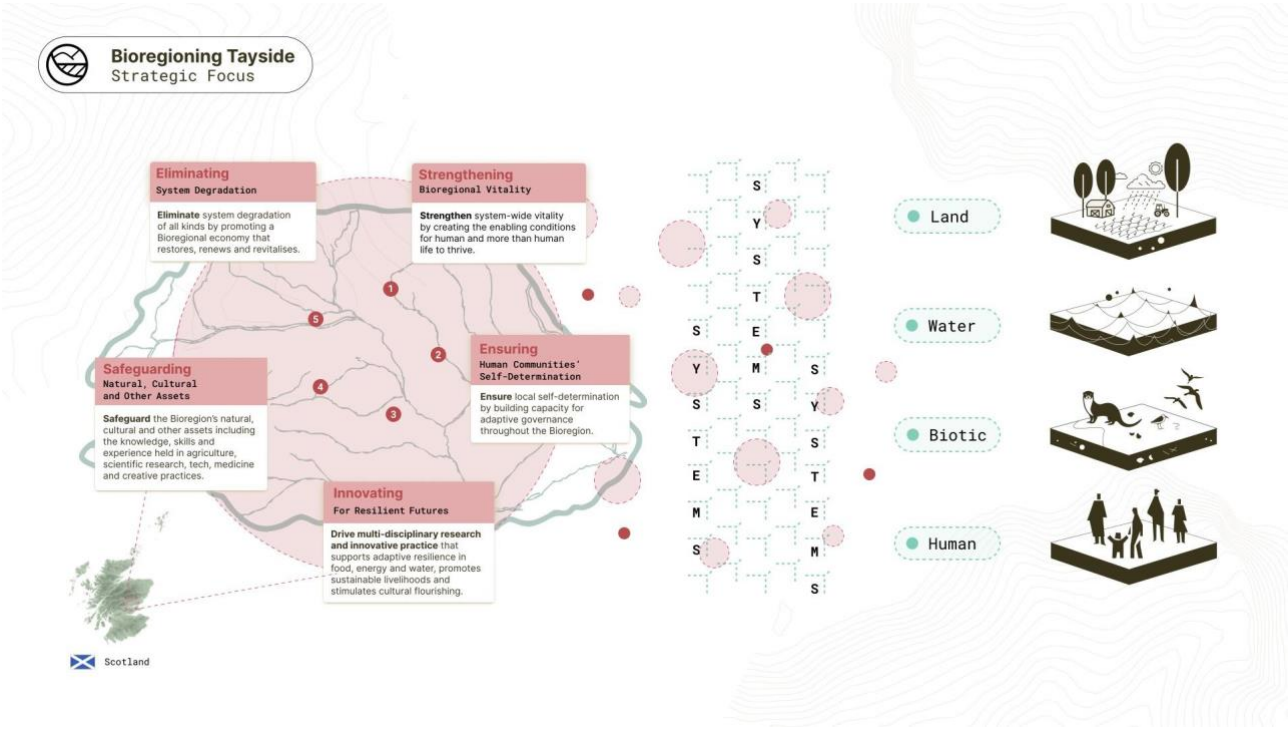
Bioregioning Tayside's Vision, Values and Strategic Focus (see graphic below) flow from these attributes.

3.2.1 Eliminating System Degradation

Imagine a Tayside where industrial and agricultural activity doesn't just "do less harm" but actively heals the land, rivers, and ecosystems. This focus is about replacing extractive economic models with regenerative ones - from soil-rebuilding agriculture to businesses that measure success in ecosystem health and community well-being, not just profits. It means dismantling processes that pollute, erode, or

[4] https://bioregions.darkmatterlabs.org/

exhaust natural systems, and instead fostering practices that restore biodiversity, renew resources, and revitalize the interconnected web of life.



Graphic, Dark Matter Labs

3.2.2 Safeguarding Natural, Cultural, and Other Assets

The Bioregion's strength lies in its deep store of resources: fertile farmland, diverse landscapes, rivers, and coastlines - but also its cultural memory, skills, and creativity. This strategy recognises that safeguarding isn't about locking these away but ensuring they are cared for, shared wisely, and handed to future generations in better shape than they were found. Protecting heritage practices, traditional ecological and farming knowledge, scientific and technological innovation and creative expression all become part of one living portfolio of assets that underpin resilience.

3.2.3 Innovating for Resilient Futures

Here, Tayside positions itself as a living laboratory for sustainable innovation. It's about weaving together cutting-edge science, local ingenuity, and cross-disciplinary collaboration to address pressing challenges in food, energy, and water. Resilience in this sense means adaptive capacity - the ability to pivot in the face of climate shocks, economic shifts, and social change. From community-led renewable energy schemes to experimental food systems that blend traditional crops with climate-resilient varieties, this is where creativity meets necessity.

3.2.4 Ensuring Human Communities' Self-Determination

This focus sees governance not as a top-down process but as something rooted in place, shaped by those who live there. Building capacity for adaptive governance means empowering local councils, community groups, and local knowledge holders to make informed, collective decisions about their own futures. It is a shift away from dependency on regional and national authorities toward self-reliance, mutual support, and democratic stewardship - ensuring that Tayside's people have both the voice and the tools to navigate change.

3.2.5 Strengthening Bioregional Vitality

Vitality here means more than economic prosperity; it's about the holistic health of the entire system - human and more-than-human. The goal is to create conditions where all life in the Bioregion can flourish. This could mean restoring wetlands to support biodiversity and secure water supply, ensuring healthy soils for food security, supporting cultural spaces where communities can gather and create, and fostering relationships that knit the human and natural worlds together in mutual benefit. It's a vision of Tayside as a thriving, interconnected ecosystem.

Regeneration ultimately depends upon rebuilding the commons that enable collective life. This includes not only rivers, soils, woodlands and biodiversity, but also shared knowledge, civic relationships, public trust, cultural memory and institutions capable of stewarding them across generations. The long-term success of the Tay Bioregion will depend upon continually strengthening these commons rather than allowing them to become fragmented or enclosed.

3.3 Key Current and Potential Partners and their roles

Partner Type	Example Partner	Potential Roles
Community Organisations	Community Development Trusts, Catchment Trusts, Community Councils, Community-led nature restoration projects	**Local mobilisation & stewardship** - Convening residents, surfacing priorities, stewarding local assets, and anchoring hyper-local projects. **Knowledge holders** - Bringing place-based, traditional, lived, and cultural knowledge into bioregional decision-making. **Experimentation hubs** - Piloting small-scale regenerative initiatives that can be replicated or scaled. **Democratic feedback loops** - Providing bottom-up sensing and accountability, helping BT align strategies with lived realities.
Landowners & Land Managers	Community landowners, Public and private landowners and managers	**Custodians of ecological infrastructure** - Stewarding soils, woodlands, peatlands, rivers, and habitats central to the bioregion's health. **Implementers of regenerative land-use** - Adopting and testing practices such as agroecology, rewilding,

		integrated catchment management. **Collaborators in landscape-scale restoration** - Participating in catchment-level planning, co-benefit mapping, and monitoring. **Data contributors** - Sharing spatial and ecological data for the Bioregional Observatory.
Academic & Research Institutions	Regional Universities - Dundee, St Andrews, UHI (Perth) Abertay, other Scottish based universities outwith the Bioregion when relevant and Research Institutes such as James Hutton Institute and the Life Sciences Innovation Hub	**Research partners** - Providing evidence on climate, biodiversity, land use, hydrology, social systems, and local economies. **Innovation & technology development** - Co-developing tools, modelling approaches, decision-support systems. **Independent evaluators** - Supporting monitoring, reporting, verification (MRV) cycles aligned with the Theory of Change. **Learning ecosystem builders** - Creating pathways for student placements, citizen science, local skills development.
Regional Government & Public Agencies	The Unitary Authorities of Perth & Kinross, Angus, Fife, Stirling, Dundee City, NatureScot, SEPA, Scottish Water, Health Boards, Scottish Forestry, Forestry and Land Scotland	**Policy alignment & regulatory integration** - Ensuring that bioregional initiatives dovetail with statutory responsibilities, national frameworks, and policy levers. **Investment & coordination** - Aligning public funding with bioregional outcomes; embed catchment-scale restoration and resilience within council strategies. **Infrastructure providers** - Enabling nature-based solutions, water and energy

		resilience projects, and integrated land-water planning. **Risk management & resilience planning** - Partner with BT on climate adaptation, emergency planning, and long-term systems resilience.
Funders & Financing Institutions	Bioregional Financing Facility (BFF), regional and national public funders, National Lottery Heritage Fund, philanthropic foundations, impact investors	**Capital mobilisation** - Providing blended finance for long-term regenerative initiatives. **Innovation in financing models** - Co-developing payment-for-outcomes, natural capital funds, community wealth-building investment vehicles. **Risk-sharing** - Underwriting early-stage experimentation that enables systems innovation. **Accountability frameworks** - Supporting learning-based evaluation rather than compliance-driven reporting.
National & Regional Networks	Scottish Forum on Natural Capital, Community Wealth Building networks, Scottish Government Land Use Partnerships, National eNGOs with specific expertise e.g. Soil Association, Woodland Trust, Buglife	**Policy influence** - Amplifying regional learning to shape national agendas on land use, climate, nature restoration. **Knowledge exchange** - Sharing best practice, tools, and lessons from other bioregions, catchments, or systems-change movements. **Advocacy & legitimacy** - Providing external validation for initiatives emerging from the Bioregion, increasing visibility and credibility. **Capacity strengthening** - Building skills, offering specialist expertise (e.g., soils, forestry, pollinators).
Arts, Culture & Creative Sector	Creative and cultural practitioners, Regional and	**Sensemaking & storytelling** - Communicating bioregional

	local arts and heritage organisations, festivals, artists-in-residence programmes	narratives, shift cultural norms, create shared meaning and identity. **Engagement & participation** - Using creative practice to involve diverse groups and bring marginalised voices into the centre. **Cultural regeneration** - Helping articulate Tayside's ecological and cultural heritage as part of a regenerative economy. **Imagination & futures work** - Supporting collective visions, scenario-building, and public creativity.
Technical Infrastructure & Innovation Partners	Open-source mapping initiatives, civic tech organisations, environmental data platforms	**Digital backbone creation** - Supporting the Bioregional Observatory with open data architectures, mapping, sensor systems. **Participatory technology** - Building tools for community reporting, sensemaking, and co-decision-making. **Interoperability & standards** - Ensuring ecological, cultural, and socio-economic data layers can be shared across the ecosystem. **Ethical governance** - Supporting transparent and just handling of data, modelling, and digital innovation.
Regenerative Enterprises	Regenerative land, water and ecosystem stewardship enterprises, circular, zero-waste and materials-based regeneration, local food, energy & Infrastructure systems, social cultural and	**Demonstrators of new models** - Showcasing viable regenerative business models aligned with bioregional values. **Local economic engines -**

	knowledge-based regeneration, mobility, logistics and Bioregional connectivity	Building community wealth, create meaningful jobs, and circulate value locally. **Market-shapers -** Create demand for nature-based products and services (e.g., water stewardship, biodiversity uplift). **Long-term partners -** Anchoring economic infrastructure within a living-systems worldview.

3.4 Open Questions

To be addressed through co-design and further research:

3.4.1 Governance Purpose & Role Clarity

- How should BT's role as a "bioregional intermediary" be defined in the light of the distinct identities of the BFF, BO, BLN and Catchment Trusts - see below?
- What decisions should BT make directly, and which should be distributed to thematic bodies or catchment-level structures?
- How does BT hold *strategic coherence* without centralising power?

3.4.2 Representation, Legitimacy & Accountability

- Who does BT represent in the wider system - the bioregion, the partners, the public, nature or the ethos of regeneration?
- How can BT remain legitimate as more autonomous bodies (BFF, BLN, BO, Trusts) emerge and gain decision-making power?
- How should BT remain accountable to communities and partners without becoming overly bureaucratic?

3.4.3 Relationships & Coordination Across the Whole Architecture

- What mechanisms ensure alignment and communication between BT, BFF, BO, BLN, and the Catchment Trusts?
- Should BT convene a bioregional assembly, a stewardship council, or a governance roundtable that brings all bodies together?
- How can BT support collaboration without becoming a bottleneck?

3.4.4 Power-Sharing & Distributing Agency

- How should leadership, influence, and decision-making authority be shared across the proposed governance collaboration and financing system?

- How does BT ensure that communities, not just institutions, shape the overall direction of bioregional governance?
- What principles guide the stewarding of power between BT and more localised or specialised bodies over time?

3.4.5 Recognition of Enabling Work

- How should the value of BT's "enabling conditions" - relationship-building, convening, culture-shaping, sensemaking - be recognised by partners, funders and communities?
- How can BT's impact be evaluated when its work is mostly relational, developmental and systemic rather than project-based?
- Which of the Bioregional Health Indicators are appropriate for an intermediary whose work is mostly invisible but foundational?

3.4.6 Resourcing & Financial Sustainability

- How should BT be resourced in the long term, given its ongoing role in enabling the system to function?
- What shared funding model (core contributions, pooled funds, BFF support, public grants) best sustains BT?
- Which capacities (facilitation, systems sensing, communications, partnership-building) must BT retain in-house?

3.4.7 Knowledge, Learning & Sensemaking

- How should BT coordinate learning loops across the system so that the BO, BFF BLN and Catchment Trusts reinforce one another?
- What structures ensure that learning leads to adaptation of strategy, not just reporting?
- How does BT track bioregional change without duplicating BO functions?

3.4.8 Culture & Values Stewardship

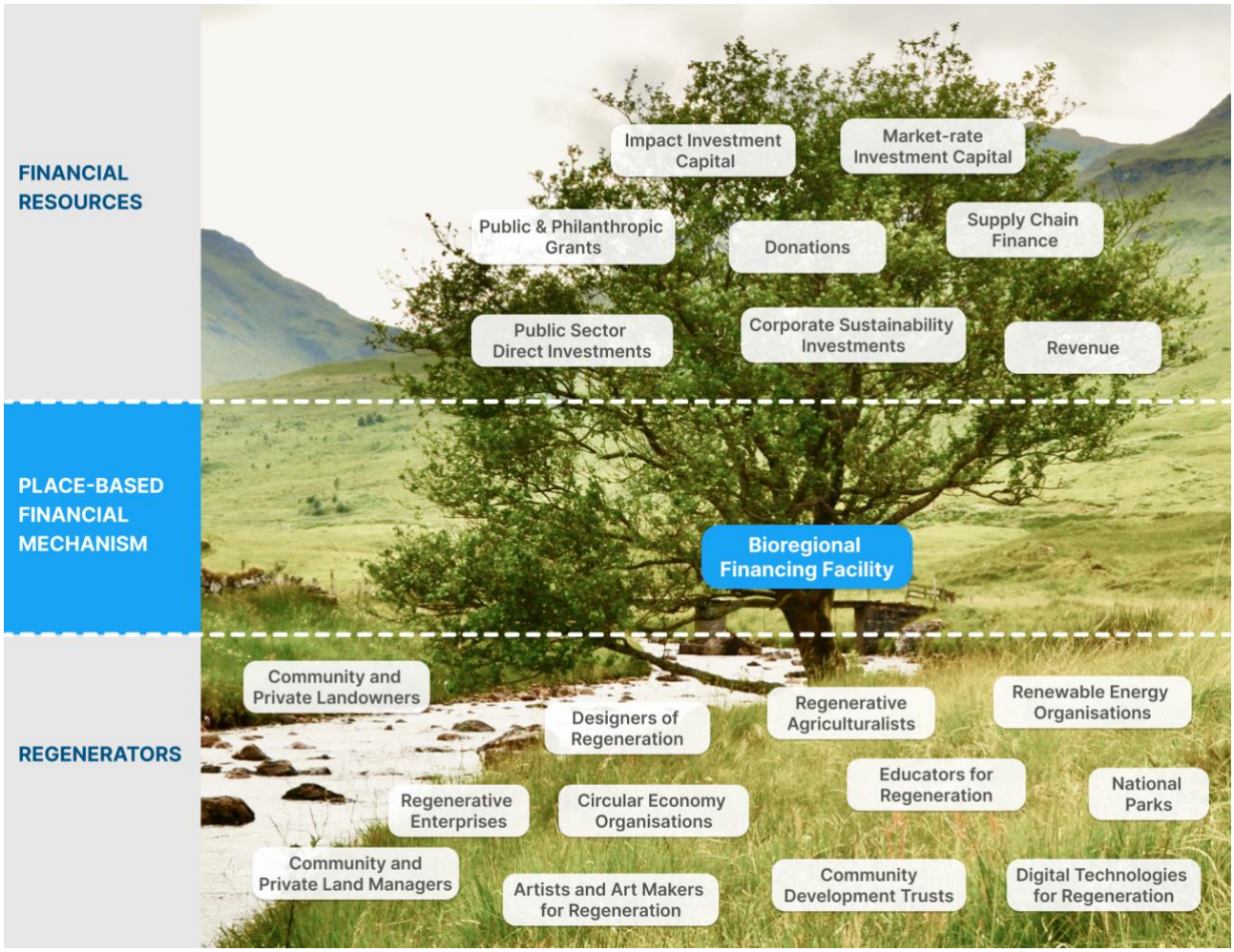
- As the bioregion grows more polycentric, who safeguards the values and worldview underpinning Bioregioning?
- How does BT nurture a shared culture of care, reciprocity and systems-thinking across diverse partners?
- How can BT ensure that more-than-human relationships remain central to governance?

4. Bioregional Financing Facility (BFF)

4.1 The Need for a Bioregional Financing Facility

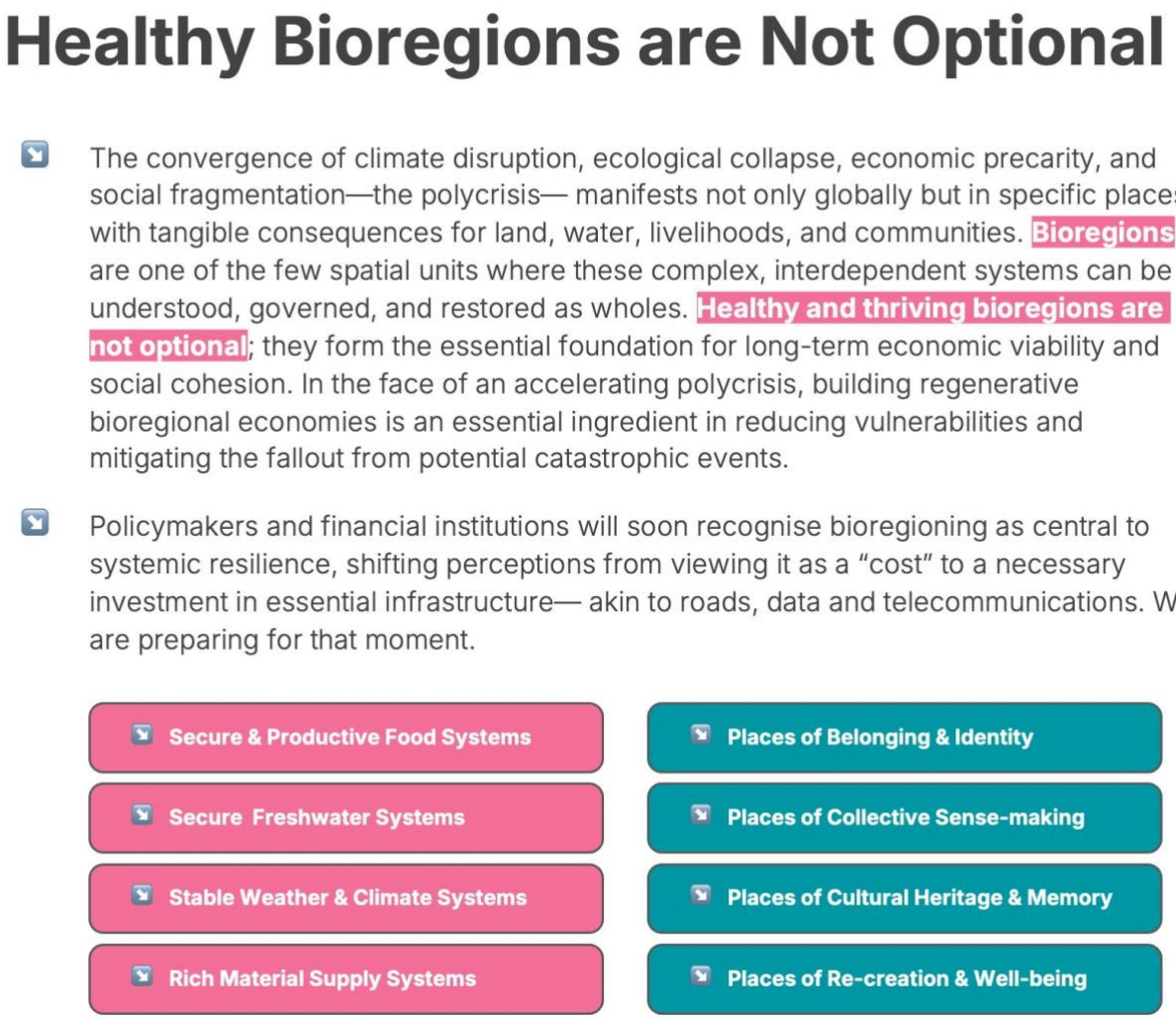
The Tayside Bioregional Financing Facility (BFF) is grounded in the recognition that healthy, thriving bioregions are not optional - they are foundational to long-term economic resilience, climate adaptation, and collective human well-being. As the impacts of the polycrisis deepen, regeneration of biotic and human systems must be understood not as a peripheral cost but as core infrastructure. The BFF responds to this imperative by creating a financial architecture designed to unlock and sustain

regenerative transitions at the bioregional scale. Current Nature Finance approaches in Scotland mostly focus on commodified carbon and biodiversity markets and siloed project funding that fail to address the systemic nature of the challenge. These models risk fragmenting ecological value, externalising risk, and excluding communities. In contrast, the BFF is rooted in the logic of place and interdependence. It proposes a new type of regional financial infrastructure that stewards the flow of capital across interconnected systems, enabling long-term investment in ecological health, community resilience, and economic transition.



Graphic, Dark Matter Labs

The purpose of finance is therefore not simply to fund projects but to maintain and increase the productive capacity of living systems. Investments are evaluated not only for the assets they create, but for the ecological, institutional and social capabilities they leave behind. Every deployment of capital should increase the Bioregion's long-term capacity for regeneration.



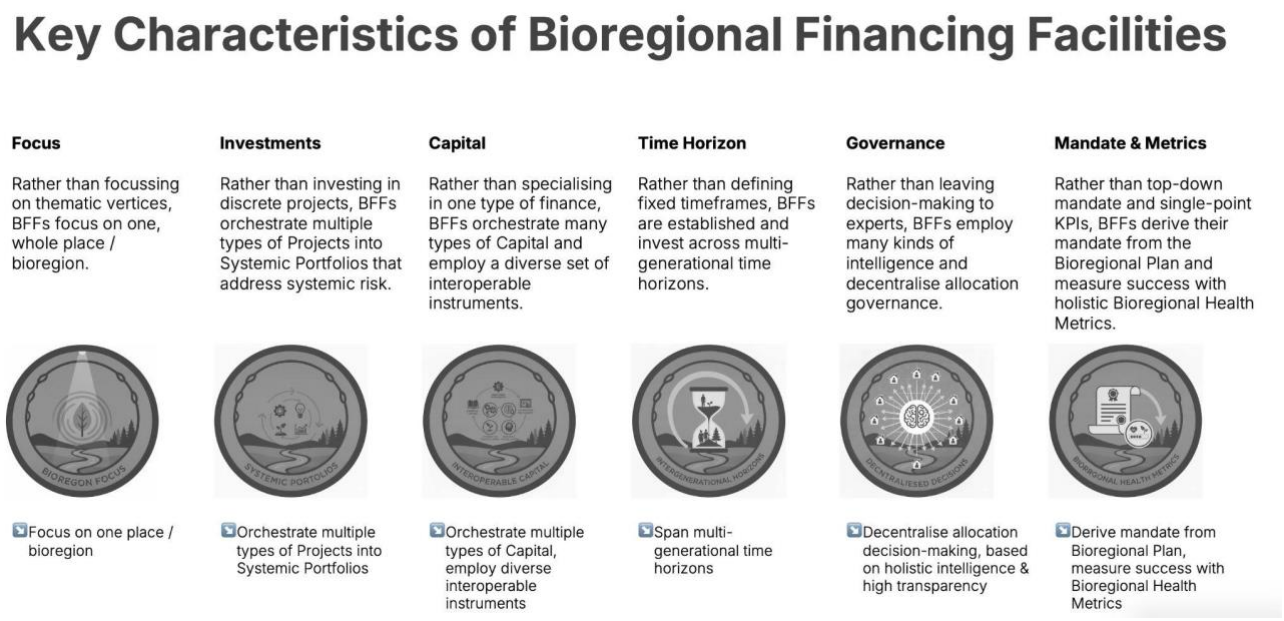
Graphic, Dark Matter Labs

4.2 A Multi-Value World View

The BFF is underpinned by a multi-value philosophy that recognises the intrinsic interdependence of Land, Water, Biotic, and Human Systems. It rejects the narrow focus on financial return, instead anchoring investment decisions in holistic Bioregional Health Metrics that track ecological vitality, social cohesion, and cultural regeneration. This worldview is essential for building a resilient future that honours both quantitative and qualitative forms of value.

4.3 A Diverse Capital Stack for Regeneration

The BFF orchestrates a range of capital types -from micro-donations and legacy gifts to grants, tithes, PES, offsets, equity, and debt investment. These are not treated as interchangeable, but are strategically matched to the risk profiles, time horizons, and expected outcomes of different types of regenerative work. Importantly, this blending of capital does not only occur at the level of individual deals, but at the bioregional systems level - enabling coordinated investment across ecological, social, and cultural infrastructures. By layering and sequencing diverse capital flows into coherent regional strategies, the BFF builds the financial resilience needed to support long-duration, high-impact transitions. It offers a blueprint for how regenerative finance can be designed to serve whole systems, not just individual projects or assets.



Graphic, Dark Matter Labs

4.4 Systemic Portfolios as Vehicles for Transformation

At the core of the BFF approach is the conviction that regenerative change cannot be achieved through isolated projects or siloed interventions or sector-based support. Traditional risk management strategies intentionally limit connectivity between projects in order to diversify and mitigate downside risk. However, this approach inherently limits the potential to maximise overall impact across a portfolio, since the optimal conditions for one initiative may undermine another, especially in regenerative place-based finance.

The BFF, by contrast, is focused on financing place-based transition. It operates in a world where urgent action is needed to reach Net Zero, restore ecosystems and strengthen communities in an increasingly volatile world, but capital for such efforts is limited. The challenge, then, is how to generate the greatest possible impact with the resources available.

To understand how we can catalyse complex transitions, we can learn from the principle of emergence identified by complexity science - the idea that the whole can be greater than the sum of its parts. To unlock these synergies however, there needs to be some connective tissue between the projects. The BFF therefore invests in systemic, interdependent portfolios that mirror the complexity and interconnectivity of the bioregion it is designed to serve.

These portfolios are aligned with the Bioregional Regeneration Strategy and are constructed to work across multiple leverage points - such as land use, changing climate patterns, water and carbon cycles, livelihoods, and cultural practices - simultaneously. Rather than chasing narrowly defined outputs, each portfolio is designed to generate compounding, place-based outcomes over time. This approach creates the conditions for transformational, not transactional, finance.

Successful portfolios therefore become more than collections of projects. They function as learning ecosystems in which each intervention strengthens the effectiveness of others through shared

knowledge, shared infrastructure, mutual reinforcement and continuously improving institutional capability.

4.5 Key Potential Partners and Their Roles

Partner Type	Example Partner	Potential Roles
Community Organisations	Community Development Trusts, Catchment Trusts, Community Councils, Community-led nature restoration projects	**Community Needs & Priorities Channel** - Providing local intelligence on needs, risks, and opportunities for regenerative investment. **Pipeline Generators** - Surfacing community-led project ideas and steward early-stage concepts. **Stewards of Social Licence** - Ensuring that investment decisions maintain community legitimacy, equity, and place-based values. **Custodians of Multi-value Outcomes** - Contributing monitoring and storytelling on social, cultural, and ecological impacts.
Landowners & Land Managers	Community landowners, Public and private landowners and managers	**Hosts of Regenerative Projects** - Providing sites for restoration, agroecology, nature-based solutions, and water and soil regeneration. **Data Contributors** - Supplying ecological, carbon, water, and land-use data crucial for evaluating investment opportunities. **Co-investors** - Bringing in-kind resources (land access, labour, capital) to complement BFF funding. **Testing Grounds for New Financing Models** - Piloting Payments for Ecosystem Services (PES) schemes, blended finance, carbon/water stewardship models.

Academic & Research Institutions	Regional Universities - Dundee, St Andrews, UHI (Perth) Abertay, other Scottish based universities outwith the Bioregion when relevant and Research Institutes such as James Hutton Institute and the Life Sciences Innovation Hub	**Evidence & Evaluation Partners** - Supporting the development of Bioregional Health Metrics and outcome frameworks. **Risk Analysis & Modelling** - Offering tools to assess ecological, hydrological, climatic, and socio-economic risks. I**nnovation Partners** - Co-developing nature-based technologies, bioregional modelling, citizen science, and new asset classes. **Independent Review** - Acting as neutral evaluators for portfolio design and impact monitoring.
Regional Government & Public Agencies	The Unitary Authorities of Perth & Kinross, Angus, Fife, Stirling, Dundee City, NatureScot, SEPA, Scottish Water, Health Boards, Scottish Forestry, Forestry and Land Scotland	**Policy Alignment & Enabling Environment** - Ensuring BFF portfolios fit with regional land-use frameworks, adaptation plans, and community wealth-building strategies. **Co-Funders** - Direct public investment into systemic portfolios rather than isolated projects. **Infrastructure Providers** - Supporting nature-based solutions, water management, transport, and energy transitions. **Regulatory Partners** - Creating pathways for permitting, data sharing, and monitoring that support regenerative project delivery.
Funders & Financing Institutions	Bioregional Financing Facility (BFF), regional and national public funders, National Lottery Heritage Fund, philanthropic foundations, impact investors	**Capital Stack Contributors** - Providing different forms of capital matched to the risk/return profile of portfolios (grants, debt, equity, guarantees, gifts). **Co-Designers of Portfolio Logic** - Helping construct blended

		systemic portfolios aligned with the bioregional regeneration strategy. **Risk-Sharing & De-risking** - Offering guarantees or first-loss tranches to enable community participation and reduce investor risk. **Outcome Funders** - Supporting payments for public goods, ecological uplift, and cultural regeneration.
National & Regional Networks	Scottish Forum on Natural Capital, Community Wealth Building networks, Scottish Government Land Use Partnerships	**Policy Influence & Scaling** - Sharing learning with national bodies and support replication in other bioregions. **Standards & Guidance** - Providing frameworks for natural capital accounting, governance, and community benefit. **Knowledge Exchange** - Facilitating cross-region learning on regenerative finance, governance, and transitions.
Arts, Culture & Creative Sector	Creative and cultural practitioners, Regional and local arts and heritage organisations, festivals, artists-in-residence programmes	**Narrative & Imagination Partners** - Shaping stories about regenerative finance, community futures, and ecological belonging. **Engagement Leads** - Helping communities understand and participate in investment decisions. **Cultural Value Stewards** - Ensuring investments support identity, heritage, arts, and cultural vitality alongside ecological restoration.
Technical Infrastructure & Innovation Partners	Open-source mapping initiatives, civic tech organisations, environmental data platforms	**Data Stewardship** - Building and maintaining platforms for ecological, social, and financial data flows. **Decision-Support Tools** - Supporting modelling, portfolio

		assembly, risk assessment, and scenario planning. **Transparency & Accountability** - Ensuring open-data principles to increase trust and legitimacy. **Digital Participation Tools** - Enabling community input, benefit-sharing tracking, and real-time monitoring.
Regenerative Enterprises	regenerative land, water and ecosystem stewardship enterprises, circular, zero-waste and materials-based regeneration, local food, energy & Infrastructure systems, social cultural and knowledge-based regeneration, mobility, logistics and Bioregional connectivity	**Project Delivery Partners -** Executing on-the-ground regenerative work within systemic portfolios. **Innovation Nodes** - Bringing entrepreneurial energy and technological solutions to ecological challenges. **Revenue-Generating Anchors** - Creating income streams that help repay loans or sustain blended finance models. **Living Labs** - Demonstrating viable regenerative business models and inspire replication.

4.6 Open Questions

To be addressed through co-design and further research:

4.6.1 Governance & Representation

- How should partner representation be structured - sectoral seats, thematic clusters, catchment-based councils, or rotating community delegates?
- What mechanisms ensure that community voices and ecological priorities have equal weight to financial actors?
- Should the BFF create a multi-stakeholder council, investment committee, and community assembly, and if so, how do they relate?

4.6.2 Decision-Making & Power Distribution

- Which decisions require full multi-stakeholder agreement, and which can be delegated to specialist groups?
- How is decision-making power shared between funders, technical experts, and community bodies?

- How can governance ensure that no single partner type (e.g., investors or large landowners) dominates portfolio design?

4.6.3 Designing & Evaluating Systemic Portfolios

- Who defines the Bioregional Health Metrics, and how are trade-offs between ecological, social, and financial returns handled?
- How are risks and benefits distributed across stakeholders?
- How do we evaluate success when outcomes may be emergent, long-term, and interdependent?

4.6.4 Capital Flow & Resource Equity

- How can the BFF ensure that underserved or smaller communities have equitable access to financing?
- What principles govern who receives first-loss capital, who contributes de-risking, and who benefits from revenue streams?
- How is long-term stewardship funded once initial investments end?

4.6.5 Data, Transparency & Community Trust

- What data governance principles ensure transparency while respecting privacy, rights, and indigenous/local knowledge?
- How do communities understand how investment decisions are made and who benefits?
- What participatory tools or practices could enable ongoing community input and oversight?

4.6.6 Cultural, Social & Ecological Values

- How does the BFF embed cultural value (heritage, identity, creativity) within financing criteria?
- What governance structures ensure that more-than-human interests are considered (e.g., ecological trustees)?
- How can narrative, story, and arts-based methods shape investment decisions?

4.6.7 Adaptive Governance & Learning

- How does the governance system learn as portfolios evolve and new partners join?
- Should the BFF commit to periodic constitutional reviews of its governance?
- What mechanisms track and adapt to uncertainty, shocks, and emerging opportunities?

5. Bioregional Catchment Trusts

Bioregional Catchment Trusts are the most localised of the five governance bodies, where participatory decision-making is central. They are a crucial link in making the system *living, grounded, and adaptive*, convening groups of residents, knowledge holders, and practitioners to determine priorities for regenerative projects and programmes and working with:

- the BFF to allocate funding based on need

- the BO to generate and utilise data and monitor projects
- the BLN to enable its catchment communities to build and share their knowledge
- BT to ensure deep grounding in local realities and constant sensing across systems

Community members from the River Ericht Catchment playing ETH Zurich's Strategy Game in 2024, photo Clare Cooper

Their core functions include:

Local Stewardship and Regeneration

- Coordinating place-based regeneration initiatives - e.g., soil restoration, river catchment management, biodiversity recovery, circular economy pilots.
- Contributing to the custodianship of commons assets (land, water, biodiversity data, local funds) for all the catchment's communities of interest and place
- Fostering partnerships among different communities of interest and place to co-design and implement regenerative projects.

Participatory Governance and Representation

- Acting as local governance nodes, representing catchment interests within the broader Tay Bioregion governance system.
  Facilitating community assemblies or forums for deliberation and decision-making.
  Ensuring inclusive participation, giving voice to residents, farmers, businesses, and underrepresented groups in shaping the local transition.

Local Intelligence and Feedback Loops

- Collaborating with the Bioregional Observatory to collect, share, and interpret environmental and socio-economic data.
- Generating fine-grained insight into ecosystem health, social wellbeing, and regenerative project performance.
- Serving as sensors within the larger system - identifying emerging challenges, innovations, and opportunities.

Financial Flow and Resource Mobilisation

- Partnering with the Bioregional Financing Facility to channel regenerative finance directly into catchment-level projects.
- Designing integrated investment portfolios - blending public, philanthropic, and community capital for systemic outcomes.
- Maintaining accountability and transparency through local impact reporting.

Learning and Cultural Renewal

- Collaborating with the Bioregional Learning Network to host place-based learning programs, apprenticeships, and storytelling.
  Supporting the revival of local knowledge systems, land practices, and cultural identities linked to the catchment.
- Promoting learning-by-doing, documenting and sharing what works across catchments.

Catchment Trusts provide the local institutional ecology through which communities learn how to steward shared resources together. Their long-term value lies as much in developing civic capability and collective intelligence as in delivering individual restoration projects.

5.1 Key Potential Partners and their roles

Partner Type	Example Partner	Potential Roles
Community Organisations	Catchment based Community Development Trusts, Catchment Trusts, Community Councils, Community-led nature restoration projects	**Anchors of local participation** - Convening residents, facilitating assemblies, and supporting inclusive participation in catchment governance. **Project initiators & stewards** - Surfacing local priorities, lead regeneration projects, and maintain stewardship of community assets. **Custodians of local knowledge** - Bringing local ecological, cultural, and lived knowledge into decision-making. **Accountability partners** - Ensuring transparency and

		legitimacy of decisions, particularly where finance and land-use change intersect.
Landowners & Land Managers	Catchment based Community landowners, Public sector landowners, agricultural landowners/managers, estate owners/managers, recreational landowners/managers, Forestry owners/managers, conservation bodies,	**Primary custodians of ecological infrastructure** - Stewarding soils, watercourses, habitats, and biodiversity assets essential to catchment health. **Collaborative land-use planners** - Participating in co-design of catchment-scale regenerative land-use strategies. **Hosts of interventions** - Providing access for monitoring, demonstration sites, nature-based solutions, and habitat restoration. **Co-investors** - Contributing land, expertise, or capital to support local regenerative portfolios.
Academic & Research Institutions	Regional Universities - Dundee, St Andrews, UHI (Perth) Abertay, other Scottish based universities outwith the Bioregion when relevant and Research Institutes such as James Hutton Institute and the Life Sciences Innovation Hub	**Scientific partners** - Gathering and interpreting environmental and socio-economic data, aligning with the Bioregional Observatory. **Monitoring & evaluation specialists** - Supporting impact metrics for local regeneration initiatives. **Knowledge translators** - Help Trusts understand complex data, model scenarios, and support evidence-based decision-making. **Learning partners** - Working with the BLN to bring students, researchers, and citizen scientists into catchment projects.
Regional Government & Public Agencies	The Unitary Authorities of Perth & Kinross, Angus, Fife, Stirling, Dundee City, NatureScot, SEPA, Scottish Water, Health Boards, Scottish Forestry, Forestry and Land Scotland	**Regulatory & technical partners** - Providing guidance on compliance, land-use planning, flood management, water quality, and forestry. **Enablers of infrastructure** -

		Supporting creation of path networks, wetland restoration, river management interventions, and green/blue infrastructure. **Funding partners** - Direct public funding streams into catchment priorities. **Spatial integration leaders** - Ensuring that catchment-level plans align with broader regional strategies (climate adaptation, local development, biodiversity frameworks).
Funders & Financing Institutions	Bioregional Financing Facility (BFF), regional and national public funders, National Lottery Heritage Fund, philanthropic foundations, impact investors	**Capital providers** - Enabling place-based regenerative projects through grants, loans, blended finance, and outcome-based funding. **Co-designers of local portfolios** - Working with Catchment Trusts to build integrated investment strategies aligned with BFF principles. **Outcome evaluators** - Supporting flexible, learning-based accountability rather than rigid project-based reporting. **Risk-sharing partners** - Helping de-risk community-led initiatives through guarantees or first-loss capital.
National & Regional Networks	Scottish Forum on Natural Capital, Community Wealth Building networks, Scottish Government Land Use Partnerships, National eNGOs with specific expertise e.g. Soil Association, Woodland Trust, Buglife	**Knowledge amplifiers** - Sharing best practice, connecting catchments to national expertise on soil, water, forestry, biodiversity, etc. **Policy influencers** - Carrying local learning into national policy arenas. **Support hubs** - Providing technical guidance, tools, and frameworks for governance, natural capital, or community wealth building.

		Capacity builders - Delivering training and support for Catchment Trusts and local groups.
Arts, Culture & Creative Sector	Catchment based creative and cultural practitioners, Regional and local arts and heritage organisations, festivals, artists-in-residence programmes	**Engagement & imagination partners** - Using storytelling, performance, and cultural practice to bring residents into the governance process. **Sensemaking facilitators** - Helping communities explore ecological identity, history, and futures. **Cultural translators** - Transforming data and complexity into narratives people can understand and act upon. **Place culture stewards** - Supporting cultural regeneration tied to landscapes, water, and local heritage.
Technical Infrastructure & Innovation Partners	Open-source mapping initiatives, civic tech organisations, environmental data platforms	**Data intermediaries** - Building tools that integrate local data into the Bioregional Observatory. **Monitoring systems providers** - Deploying sensors, habitat mapping tools, and community-based monitoring technology. **Digital participation facilitators** - Provide apps/platforms for community reporting, mapping, and governance participation. **Interoperability custodians** - Ensuring that data from multiple partners can be shared, understood, and used effectively.
Regenerative Enterprises	regenerative land, water and ecosystem stewardship enterprises, circular, zero-waste	**Delivery partners** - Implementing regenerative

	and materials-based regeneration, local food, energy & Infrastructure systems, social cultural and knowledge-based regeneration, mobility, logistics and Bioregional connectivity	land, water, and materials projects within catchments. **Innovation demonstrators** - Showcasing business models aligned with ecological and community wellbeing. **Economic anchors** - Contributing to local livelihoods, skills development, and community wealth building. **Supply-chain collaborators** - Helping capture value locally through regenerative products and services.

Open Questions

To be addressed through co-design and further research:

5.2.1 Governance Structure & Representation

- How should each catchment define representation - by geography, sector, community of interest, lived experience, land ownership or by specific domains such as future generations, food security, rights of nature?
- What mechanisms ensure balance between professional expertise and grassroots voice?
- Should each Trust have a formal board, a community assembly, working groups - or a hybrid?
- What legal form best supports participatory governance while enabling financial responsibility?

5.2.2 Relationship with Bioregional Structures

- How do Catchment Trusts interact with Bioregioning Tayside, the BFF, the Observatory, and the Learning Network?
- What decisions are made at catchment level versus bioregional level?
- How are conflicts or differences of priority between catchments mediated?
- What information must flow from Trusts to bioregional bodies (and vice versa) to maintain a living system of governance?

5.2.3 Equity, Inclusion & Community Power

- How do we ensure that marginalised or less-resourced groups have real influence in catchment decisions?
- How is "community" defined in each catchment: by residence, land ownership, practice, or identity?
- What methods ensure participation beyond the “usual suspects”?

5.2.3 Data, Knowledge & Monitoring

- What data standards, protocols, and sharing agreements are needed for Trusts to work with the Bioregional Observatory?
- How do local knowledge systems and cultural histories inform evidence-based decision-making?
- Who owns or steward's catchment-level data?

5.2.5 Finance, Risk & Accountability

- How do Catchment Trusts manage funds while maintaining participatory integrity?
- What criteria determine which projects are financed, prioritised, or sequenced?
- How are risks shared between community organisations, landowners, enterprises, and funders?
- What accountability mechanisms are appropriate for community-led but financially responsible bodies?

5.2.6 Capacity, Skills & Learning

- What support do Trusts need in facilitation, ecology, finance, data literacy, and governance?
- How does the Learning Centre help each Trust become a place-based "learning system"?
- How do Trusts share learning horizontally with one another?

5.2.7 Cultural Identity & Sensemaking

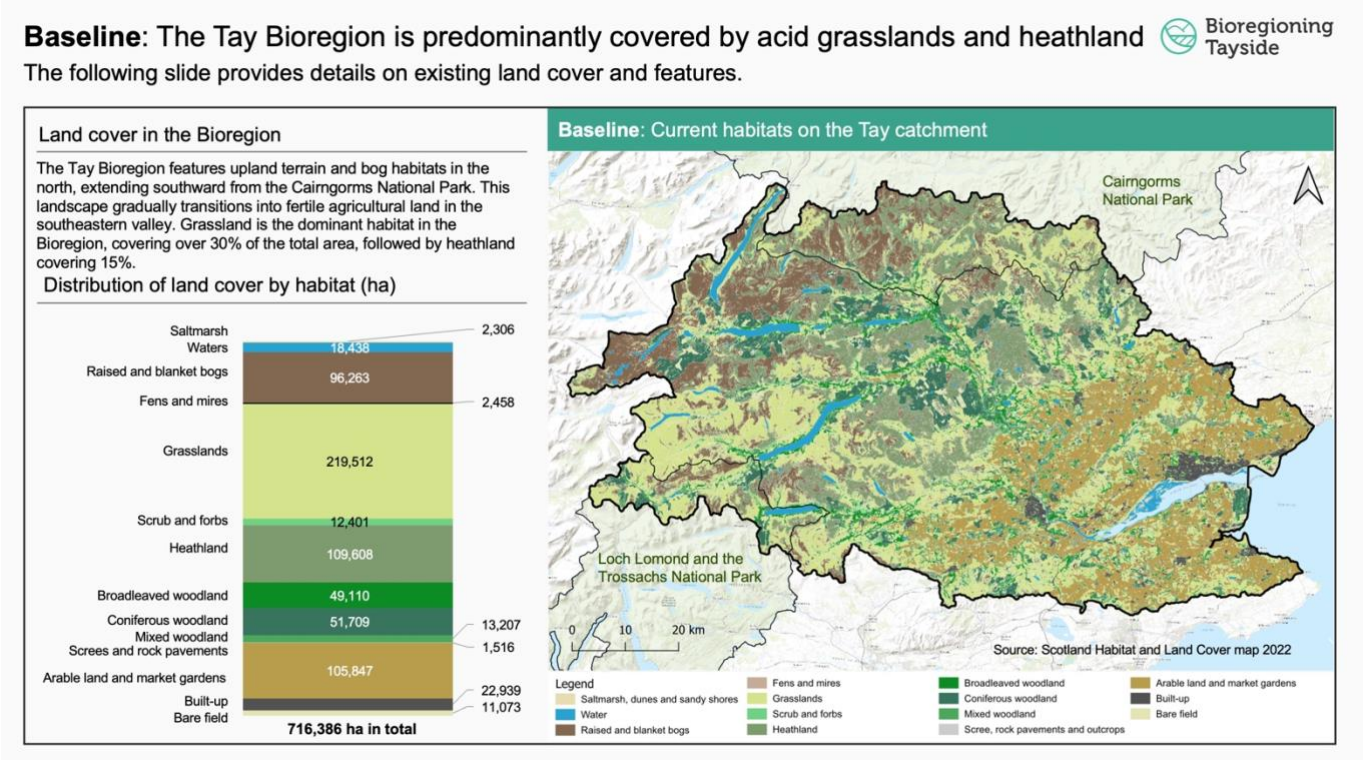
- How can arts and culture be embedded in governance rather than treated as optional add-ons?
- How do Trusts support community narrative-building around their catchment's identity and future?
- What practices ensure that regeneration is cultural and social, not only ecological?

6. Bioregional Observatories (BO's)

6.1 The Need for Bioregional Observatories

Across the UK and globally, regions face accelerating ecological, social, and economic pressures. These include biodiversity loss, cultural erosion, social fragmentation, and climate disruption - all unfolding within complex, interdependent landscapes. In such contexts, high-quality decision-making for regeneration and resilience must be deeply informed by place-specific knowledge.

Yet most existing data systems are fragmented, overly technical, or disconnected from lived experience. They often fail to reflect the interconnected realities of place - ecological, cultural, social, and economic - and lack mechanisms for shared meaning-making and governance. There is a pressing need for situated, multi-dimensional intelligence infrastructures that can sense, understand, and support bioregional health in its full complexity.



A slide from the high-level opportunity mapping for nature restoration in the Tay Bioregion undertaken by Palladium in 2025.

The **Bioregional Observatory (BO)** emerges to meet this need. It acts as the **intelligence, observation, and sense-making hub** for all the Bioregion's communities of interest and place and of the Bioregional Financing Facility (BFF), serving as both a trusted source of insight and a commons-based platform for collaboration, learning, and action. The BO supports communities and institutions in recognising and nurturing patterns that promote bioregional vitality over time.

6.2 Value Proposition of Bioregional Observatories

Bioregional Observatories (BOs) offer a distinct, place-based infrastructure to generate, interpret, and apply knowledge in service of bioregional health and regeneration. Their value lies in enabling long-term, whole-system intelligence, grounded in both rigorous data and lived experience and should therefore be understood not simply as a repository of data but as part of the Bioregion's distributed sensing system. By integrating scientific evidence with lived experience and cultural understanding, it enables the whole governance architecture to perceive emerging patterns earlier and adapt more intelligently

The core functions include:

6.2.1 Development of Bioregional Health Metrics

At the heart of the Observatory is a shared, evolving framework for understanding and stewarding bioregional health. This requires moving beyond static indicators to a dynamic, and non-linear set of indicators that reflect the qualities and capacities a bioregion needs to flourish. The Observatory supports the co-creation of this framework, ensuring it is:

- **Systemic** – spanning ecological, social, economic, cultural, and spiritual dimensions of life in the bioregion.
- **Situated** – rooted in local context, values, and narratives, while allowing comparability across regions.
- **Multi-scalar** – capable of capturing patterns at nested scales (field, neighbourhood, watershed, region).
- **Relational** – attentive to flows, interdependencies, and relationships rather than isolated metrics.
- **Participatory** – co-designed and co-governed with communities of place and interest.
- **Adaptive** – responsive to change, uncertainty, and learning over time.

The result is a Bioregional Health Metrics Framework that:

- Guides strategic planning, investment, and action across sectors.
- Enables tracking of the bioregion's capacity to regenerate its ecological and social fabric.
- Reflects the rhythms, patterns, and feedback loops of place, supporting long-term resilience.

6.2.2 Monitoring & Measurement of Bioregional Health

Once defined, these metrics form the backbone of an integrated monitoring system that captures both quantitative and qualitative dimensions of change. The Observatory serves as the custodian and interpreter of this system, ensuring ongoing, place-informed sense-making. Core monitoring functions include:

- **Tracking Hard Data:** Empirical, often technologically captured data (e.g. biodiversity, water quality, soil carbon, economic flows)
- **Tracking Warm Data**: Qualitative insights into relational dynamics, stories told and histories remembered
- **Tracking Patterns**: Focusing not just on individual indicators but on systemic patterns - such as increasing polycentricity, circularity, intergenerational reciprocity, or landscape literacy.
- **Tracking Resilience Indicators**: Capacities such as early detection of emerging problems, speed and coordination of collective responses, and adaptive governance and decision-making under stress.

6.2.3 Collective Sense-Making

At the heart of the Observatory lies a commitment to collective, participatory interpretation. Beyond gathering and analysing data, the BO creates structured, open access spaces for communities of place and interest to come together and make sense of what is happening in their region. Key elements include:

- **Community interpretation forums**, where people from diverse walks of life - farmers, landowners, educators, artists, youth, elders - engage in shared reflection on regional data, stories, and trends.

- **Integration of experiential knowledge and local narratives** into the interpretation process, recognising that people living and working in the landscape bring indispensable insight into bioregional dynamics.
- **Accessible translation of data and analysis**, using visualisation, metaphor, storytelling, and cultural references to bridge technical knowledge and community understanding.
- **Co-production of meaning**, where different forms of knowledge - scientific, lived, cultural, spiritual - are placed in dialogue to generate shared understanding and orientation.

By embedding sense-making as a shared civic function, the BO strengthens legitimacy, relevance, and care in regional governance - and fosters deeper stewardship and agency across the bioregion.

6.2.4 Scenario Modelling & Stress Testing

The BO equips the bioregion with tools for strategic foresight, enabling communities and decision-makers to explore multiple futures and proactively design for resilience. Key functions include:

- **Dynamic scenario modelling** to test the consequences of different policy or investment paths under various conditions (e.g. climate shocks, policy shifts, market volatility).
- **Stress testing of bioregional systems**, identifying potential points of failure or cascade risk across sectors (e.g. water, health, housing, food, biodiversity).
- **Option development** to support robust decision-making under uncertainty, highlighting interventions that perform well across a range of futures.

This capacity helps shift decision-making from reactive to anticipatory, supporting better preparedness, prioritisation, and system stewardship.

6.2.5 Feedback into Decision-Making and Learning

The Observatory ensures that knowledge and insight generated through monitoring, modelling, and sense-making meaningfully inform decisions across the Bioregion **-** particularly the capital allocation processes of the BFF. Mechanisms include:

- **Data visualisation and storytelling** tailored to diverse audiences - from policy makers and funders to farmers and educators.
- **Decision support environments** such as “situation rooms” with dashboards or “decision theatres” that bring together relevant data, projections, and community perspectives to guide investment committee deliberations.
- **Real-time feedback loops** that allow investments, projects, and policies to be adjusted based on actual outcomes and shifting context.

This reinforces trust, transparency, and the legitimacy of regional governance - and supports learning-led investment and stewardship practices.

6.3 Key Potential Partners and Their Roles

Partner Type	Example Partners	Potential Roles
Community Organisations	Community Development Trusts, Catchment Trusts, Community Councils, Community-led nature restoration projects	**Local Intelligence Contributors -** Providing fine-grained ecological, social, and cultural observations, feeding both "hard" and "warm" data into the Observatory. **Custodians of Lived Experience -** Bringing narratives, community histories, and local stories that enrich sense-making and shape Bioregional Health Metrics. **Participatory Sense-Making Partners -** Participating in interpretation forums, ensuring metrics and insights reflect community realities. **Data Democracy Stewards -** Helping ensure data practices are transparent, accessible, and accountable to local communities.
Landowners & Land Managers	Community landowners, Public and private landowners and managers	**Primary Data Providers -** Contributing biodiversity monitoring, soil metrics, water data, land management practices, and ecological change observations. **Implementation Feedback Partners -** Providing on-the-ground insight into the effects of different practices and interventions on ecosystems. **Scenario Testing Collaborators -** Participating in modelling exercises to test land-use futures, resilience risks, and catchment-level options. **Stewards of Monitoring Infrastructure -** Hosting sensors, ecological monitoring plots, and data-gathering sites.

Academic & Research Institutions	Regional Universities - Dundee, St Andrews, UHI (Perth) Abertay, other Scottish based universities outwith the Bioregion when relevant and Research Institutes such as James Hutton Institute and the Life Sciences Innovation Hub	**Scientific Methodology Leads -** Co-developing Bioregional Health Metrics, monitoring frameworks, and analytic methods. **Modelling & Foresight Experts -** Supporting scenario modelling, stress testing, and long-term resilience modelling. **Data Integration Specialists - Building** bridges between academic data sets and community-generated knowledge. **Training & Capacity Builders - Providing** data literacy, GIS, system dynamics, and evaluation skills to Catchment Trusts and other partners.
Regional Government & Public Agencies	The Unitary Authorities of Perth & Kinross, Angus, Fife, Stirling, Dundee City, NatureScot, SEPA, Scottish Water, Health Boards, Scottish Forestry, Forestry and Land Scotland	**Statutory Data Providers -** Supplying regulatory data on water, land use, forestry, health, climate risk, and biodiversity. **Policy Integration Partners -** Ensuring Observatory insights feed into planning, climate adaptation, and resilience strategies. **Risk & Scenario Contributors -** Bringing regional risk assessments and strategic priorities into modelling exercises. **Infrastructure Enablers -** Supporting the deployment of monitoring equipment, mapping systems, and shared data platforms.
Funders & Financing Institutions	Regional and national public funders, National Lottery Heritage Fund, philanthropic foundations, impact investors	**Investors in Knowledge Infrastructure -** Funding development of metrics, monitoring networks, and decision-support platforms. **Insight Users -** Using Observatory outputs to guide portfolio design, risk analysis, and long-term investments.

		Evaluation & Learning Partners - Supporting adaptive learning loops, enabling ongoing refinement of what counts as "value" in the bioregion.
National & Regional Networks	Scottish Forum on Natural Capital, Community Wealth Building networks, Scottish Government Land Use Partnerships	**Knowledge Disseminators -** Sharing BO frameworks and findings across Scotland and beyond. **Standard Setters & Alignment Partners -** Helping ensure BO metrics and methodologies align with national or cross-regional standards. **Amplifiers of Local Voices -** Carrying bioregional insights into national conversations and influence policy agendas.
Arts, Culture & Creative Sector	Creative and cultural practitioners, Regional and local arts and heritage organisations, creative and cultural practitioners, festivals, artists-in-residence programmes	**Data Translators -** Turning complex data into accessible, engaging formats – exhibitions, storytelling, visualisations, performances. **Cultural Sensemakers -** Bringing cultural histories, metaphors, and narratives into the interpretation of place. **Engagement Facilitators -** Creating participatory spaces where diverse communities can interact with data and meaning-making. **"Warm Data" Contributors -** Documenting relational, experiential, and cultural dimensions of place health.
Technical Infrastructure & Innovation Partners	Open-source mapping initiatives, civic tech organisations, environmental data platforms	**Platform Builders -** Developing open-source systems for data collection, storage, visualisation, and access. **Interoperability Engineers -** Ensuring data from land managers, agencies, and community groups can integrate seamlessly. **Sensor & Monitoring**

		Innovators - Deploying new technologies for soil, water, biodiversity, and climate data. **Data Ethics & Governance Advisors -** Supporting transparency, consent, privacy, and equitable data ownership.
Regenerative Enterprises	Regenerative land, water and ecosystem stewardship enterprises, circular, zero-waste and materials-based regeneration, local food, energy & Infrastructure systems, social cultural and knowledge-based regeneration, mobility, logistics and Bioregional connectivity	**Living Laboratories -** Providing real-world examples of regenerative practices, contributing operational data and Lessons. **Impact Demonstration Sites -** Helping test how regenerative business models affect bioregional health. **Innovation Partners -** Co-developing new indicators (e.g., circularity, local multipliers, cultural vitality). **Feedback Loops -** Supplying post-investment or post-intervention data on ecological and social impacts.

6.4 Open Questions

To be addressed through co-design and further research:

6.4.1 Governance, Stewardship & Legitimacy

- Who "owns" the Observatory? Is it a commons, a cooperative, a consortium, or a BT-led entity?
- How do we ensure balanced representation across sectors without diluting community influence?
- What principles should guide who sits on BO governance bodies (e.g., boards, councils, sense-making assemblies)?

6.4.2 Participation & Collective Sense-Making

- What structures enable meaningful participation from residents, land managers, youth, elders, and knowledge holders?
- How do we embed cultural and artistic practices in sense-making, alongside scientific and technical analysis?
- How frequently should sense-making forums be held, and who convenes and facilitates them?

6.4.3 Data Governance, Ethics & Ownership

- Who controls access to data collected across the bioregion, and what rights do communities have?
- How can we ensure transparent, equitable data practices across sectors with differing power and resources?
- What safeguards protect sensitive ecological, cultural, or community-derived data?

6.4.4 Bioregional Health Metrics

- How do we balance ecological, social, cultural, economic, and spiritual dimensions within a unified framework?
- Who decides which indicators matter most for bioregional health - and how are trade-offs handled?
- How do metrics remain adaptive over time without losing continuity?

6.4.5 Integration with BT, BFF, Catchment Trusts & the BLN

- What does a clear, operational feedback loop look like between the Observatory and the BFF's investment committee?
- How do Catchment Trusts feed local data into BO systems in a way that respects capacity, culture, and place?
- How will the Bioregional Learning Network use Observatory data to support skills development and public understanding?

6.4.6 Scenario Modelling & Risk

- Who participates in scenario modelling processes, and how diverse should those inputs be?
- How do we avoid technical or institutional bias in modelling future risks and opportunities?
- How do we incorporate more-than-human perspectives and ecological agency into future modelling?

6.4.7 Capacity, Skills & Infrastructure

- What technical skills are needed to operate and maintain the Observatory?
- How can we democratise data and modelling skills so communities can participate?
- What infrastructure (digital, physical, human) is required, and who funds and maintains it?

7. Bioregional Learning Network

The Bioregional Learning Network is a living school of place, where people of all ages come to learn with, from, and for the Tay Bioregion. It offers immersive, experiential, and transformative education rooted in the land, waters, and cultures that sustain life. By weaving together traditional knowledge,

contemporary science, and creative practice, it cultivates the skills, values, and relationships needed for thriving communities and resilient ecosystems.

7.1 The Need for a Bioregional Learning Network (BLN)

One of the greatest needs for the BLN is to address the fragmentation of knowledge & action in the Bioregion. Environmental, social, and economic challenges are often tackled in silos (see Part 1 of the Framework for Action), yet local communities need tools and knowledge to adapt to a series of crises, all of which are happening simultaneously while at the same time regenerating ecosystems. The BLN's role will be to integrate learning across sectors within a place-based context.

The BLN's 'Bioregional Curriculum' will focus on teaching and learning that is deeply rooted in the local environment, culture, and community. The goal is to foster ecological literacy, place-based knowledge, and responsible citizenship by connecting students directly to their bioregion. A holistic approach that is not currently available in the Bioregion.

Main Topics will include:

- Place-Based Education
    - Learning centred on the local landscape, community, and ecology.
    - Fieldwork, outdoor classrooms, and local history studies.

Local members of the communities of Strathmore learning how to take sediment cores of an ox bow lake in the River Isla to understand past flood events.

- Ecological Literacy
    - Understanding ecosystems, biodiversity, and sustainability.
    - Emphasis on cycles (e.g., water, carbon), food webs, and habitat dynamics.

- Local History and Culture
    - The preservation and revitalisation of place-based knowledge
    - Regional literature, arts, and storytelling.
    - Settlement patterns and cultural heritage.

- Sustainable Living
    - Practical skills like gardening, composting, and renewable energy.
    - Resource conservation and waste reduction.
    - Local food systems and permaculture.

- Civic Engagement and Social Justice
    - Empowering students to participate in local and adaptive governance and environmental stewardship.
    - Equity and inclusion, especially regarding Indigenous and marginalized communities.
    - Understanding the impacts of global issues (like climate change) at the local level.

- Interdisciplinary Learning
    - Integration of science, social studies, language arts, and art around bioregional themes.
    - Project-based and experiential learning.

- Mapping and Sense of Place
    - Learning to read and create maps - topographic, watershed, ecological.
    - Exploring local geography and land use patterns.

- Natural Cycles and Seasons
    - Observing phenology (seasonal changes in plants and animals).
    - Adapting learning rhythms to natural cycles.

- Local Economy and Livelihoods
    - Study of local industries, sustainable business practices, and community resilience.
    - Opportunities to explore alternatives to global consumerism, such as cooperative economies.
    - Training and support for enterprises that wish to build a regenerative economy,

- Ethics and Environmental Philosophy

- Deep ecology, interconnectedness of life, and stewardship ethics.

- Reflective and critical thinking about human-nature relationships.

7.2 The Value Proposition

The Bioregional Learning Network will be both a hub for regeneration and a bridge-builder across knowledge systems, stakeholders, and scales. Its value proposition lies in enabling communities, institutions, and enterprises to co-create resilient, just, and thriving futures rooted in place.

For Communities it will offer:

- Local empowerment: Provides a hub for co-learning, collaboration, and action across citizens, organizations, and local authorities.
- Sense of identity & belonging: Strengthens connection to place, culture, and heritage, fostering stewardship.
- Resilience & well-being: Supports climate adaptation, food sovereignty, and ecosystem restoration, improving quality of life.

For Governments & Institutions it will offer

- Collaboration platform: Serves as a neutral convenor between stakeholders (government, business, civil society).
- Pilot for scaling: Creates models of regenerative practice that can be replicated in other regions.

For Enterprises & Innovators it will offer

- Innovation ecosystem: Provides a space to incubate regenerative enterprises and circular economy initiatives.
- Reputation & responsibility: Positions enterprise as place-based partners in sustainable transformation.
- Talent pipeline: Trains people in relevant skills for the emerging green economy.

For Education & Research it will offer:

- Interdisciplinary learning: Bridges indigenous knowledge, local practice, and global science.
- Living labs: Creates experimental spaces for applied research in ecosystems, agriculture, energy, and governance.
- Knowledge dissemination: Shares best practices within and beyond the bioregion.

7.3 Key Potential partners and their roles

Partner Type	Example Partner	Potential Roles
Community Organisations	Community Development Trusts, Catchment Trusts, Community Councils, Community-led nature restoration projects	**Hosts of Local Learning Spaces -** Providing venues for outdoor classrooms, community-based training, citizen science, and cultural learning. **Knowledge Holders & Storykeepers -** Bringing forward lived experience, local history, land-based knowledge, and cultural memory essential for place-based pedagogy. **Co-designers of Curriculum -** Ensuring learning programmes are grounded in community

		needs, values, and aspirations. **Pathways for Local Participation -** Helping engage residents of all ages in BLN activities and ensure inclusion of underrepresented groups.
Landowners & Land Managers	Community landowners, Public and private landowners and managers	**Living Laboratories -** Providing access to farms, forests, wetlands, rivers, and estates for field learning, apprenticeships, and demonstration projects. **Custodians of Ecological Knowledge -** Sharing practical knowledge of land management, habitat restoration, regenerative agriculture, and water stewardship. **Regenerative Practice Trainers -** Participating in hands-on teaching about soil, biodiversity, grazing, forestry, and sustainable land-use systems. **Partners in Youth Engagement -** Offering pathways for young people interested in land-based livelihoods.
Academic & Research Institutions	Regional Universities - Dundee, St Andrews, UHI (Perth) Abertay, other Scottish based universities outwith the Bioregion when relevant and Research Institutes such as James Hutton Institute and the Life Sciences Innovation Hub	**Curriculum Development Partners -** Contributing scientific expertise (ecology, hydrology, climate science, social research, cultural studies) to the bioregional curriculum. **Providers of Research & Learning Infrastructure -** Supporting field stations, labs, citizen science platforms, and monitoring programmes. **Interdisciplinary Knowledge Integrators -** Bridging scientific knowledge with cultural, historic, and community-based learning. **Training & Accreditation**

		Partners - Developing qualifications, micro credentials, experiential modules, and placements rooted in bioregional themes.
Regional Government & Public Agencies	The Unitary Authorities of Perth & Kinross, Angus, Fife, Stirling, Dundee City, NatureScot, SEPA, Scottish Water, Health Boards, Scottish Forestry, Forestry and Land Scotland	**Policy & Skills Alignment Partners -** Ensuring that BLN learning pathways link to local workforce needs, climate adaptation strategies, and land-use priorities. **Supporters of Community Education -** Resourcing local learning programmes in areas such as biodiversity, flood risk, food resilience, and public health. **Data & Expertise Providers -** Offering access to datasets and technical knowledge relevant to learning (watersheds, species, planning, etc.). **Connectors to Schools & Colleges -** Helping integrate BLN themes into formal education systems.
Funders & Financing Institutions	Bioregional Financing Facility (BFF), regional and national public funders, National Lottery Heritage Fund, philanthropic foundations, impact investors	**Investors in Learning Infrastructure -** Supporting development of training hubs, outdoor classrooms, curriculum design, and apprenticeship pathways. **Partners in Scaling Regenerative Skills -** Funding enterprise incubation, youth programmes, skills pipelines, and place-based innovations. **Long-Term Supporters of Cultural Renewal -** Enabling continuity of intergenerational learning and knowledge stewardship.
National & Regional Networks		

	Scottish Forum on Natural Capital, Community Wealth Building networks, Scottish Government Land Use Partnerships, National eNGOs with specific expertise e.g. Soil Association, Woodland Trust, Buglife	**Amplifiers of Best Practice -** Sharing learning models developed in Tayside across Scotland and beyond. **Knowledge Sharers -** Bringing in external expertise on soils, forestry, food systems, biodiversity, justice, and community wealth building. **Strategic Aligners -** Helping ensure BLN activities complement national education, land use, and climate ambitions.
Arts, Culture & Creative Sector	Creative and cultural practitioners, Regional and local arts and heritage organisations, festivals, artists-in-residence programmes	**Creators of Place-Based Pedagogy -** Using storytelling, visual arts, performance, craft, and creative workshops to deepen connection to place. **Sensemaking Facilitators -** Transforming ecological or social data into emotionally resonant experiences. **Cultural Heritage Stewards -** Revitalising local histories, languages, crafts, and cultural ecologies that shape identity and belonging. **Engagement Innovators -** Attracting diverse participants into learning spaces through creativity.
Technical Infrastructure & Innovation Partners	**Creators of Place-Based Pedagogy -** Using storytelling, visual arts, performance, craft, and creative workshops to deepen connection to place. **Sensemaking Facilitators -** Transforming ecological or social data into emotionally resonant experiences. **Cultural Heritage Stewards -** Revitalising local histories, languages, crafts, and cultural ecologies that shape identity and belonging.	**Digital Learning Environment Builders -** Developing online platforms for collaborative learning, mapping, and resource sharing. **Tools for Sense of Place -** Providing mapping applications, geospatial storytelling, and ecological monitoring technologies. **Data Literacy Supporters -** Enabling communities to understand and work with

	Engagement Innovators - Attracting diverse participants into learning spaces through creativity.	ecological, social, and economic data.
Regenerative Enterprises	Regenerative land, water and ecosystem stewardship enterprises, circular, zero-waste and materials-based regeneration, local food, energy & Infrastructure systems, social cultural and knowledge-based regeneration, mobility, logistics and Bioregional connectivity	**Practical Training Sites -** Offering apprenticeships, placements, and practical training in regenerative skills. **Enterprise Incubation Partners -** Helping learners start or scale regenerative businesses. **Economic Anchors -** Exemplifying the kinds of livelihoods and business models the BLN curriculum prepares people for. **Feedback Providers -** Sharing skills gaps and opportunities to help shape learning priorities.

7.4 Open Questions

To be addressed through co-design and further research:

7.4.1 Purpose, Identity & Positioning

- Should the BLN be framed as a formal institution, a distributed network, a cooperative, or a community-led commons?
- How does the BLN differentiate itself from existing educational providers while complementing them?

7.4.2 Governance & Representation

- Who should have decision-making power within the BLN - communities, educators, enterprises, land managers, or BT?
- How should catchments, communities of interest, and youth be represented?
- What governance structures (e.g., advisory councils, learning assemblies, thematic working groups) best reflect a bioregional ethos?

7.4.3 Relationship with Other Bioregional Bodies

- How should the BLN interface with the Bioregional Observatory, the BFF, Catchment Trusts, and Bioregioning Tayside?
- What shared governance mechanisms are needed to ensure alignment across the system?

- How do insights from the Observatory feed into curriculum, and how does BLN feed back into sense-making?

7.4.4 Curriculum & Pedagogy

- Who decides which knowledge systems (scientific, cultural, indigenous, artistic) are prioritised?
- How do we ensure that place-based learning does not replicate dominant narratives or exclude marginalised perspectives?
- How can learning remain adaptive to changing ecological and social conditions?

7.4.5 Inclusion, Equity & Access

- How do we ensure all communities - including rural, urban, minority ethnic groups, low-income, and youth groups - benefit equally?
- What barriers (transport, time, childcare, digital access) must governance actively address?
- How can the BLN create pathways for communities who have historically been excluded from land and knowledge systems?

7.4.6 Resourcing, Funding & Sustainability

- Who pays for learning infrastructure, coordination, curriculum development, and community-led programmes?
- How does the BLN partner with the BFF to ensure long-term financial resilience?
- What blended funding models might sustain the network (grants, membership, contracts, social investment)?

7.4.7 Learning Infrastructure Design

- Should the network consist of hubs, learning sites, roaming educators, seasonal programmes, or all of these?
- What role should digital learning platforms play?
- How can the BLN become a “learning ecosystem” rather than a discrete institution?

7.4.8 Evaluation, Impact & Adaptation

- How will the BLN measure success in ways that honour cultural and ecological value, not just outputs?
- What feedback loops ensure ongoing adaptation and community influence?
- How do we capture stories and experiences, not just metrics, as part of evaluation?

8. Conclusion – a new Bioregional Operating System

The five organisational forms described in this Framework should not be understood as separate organisations pursuing independent objectives. Together they constitute an evolving operating system for the Tay Bioregion: coordinating information, finance, learning, stewardship and collective decision-making in ways that continually increase the adaptive capacity of place. As natural ecosystems regulate themselves through countless interconnected relationships, so this governance architecture seeks to enable distributed coordination rather than centralised control.

Ultimately, this Framework proposes that regeneration is not achieved through isolated interventions but through the continual cultivation of the Bioregion's capacity to care for itself. Governance, finance, learning, observation and stewardship become mutually reinforcing capabilities that enable the Tay Bioregion to remain adaptive, productive and resilient across generations. In doing so, the Framework seeks not simply to restore ecosystems, but to establish the institutional foundations of a flourishing bioregional commons.