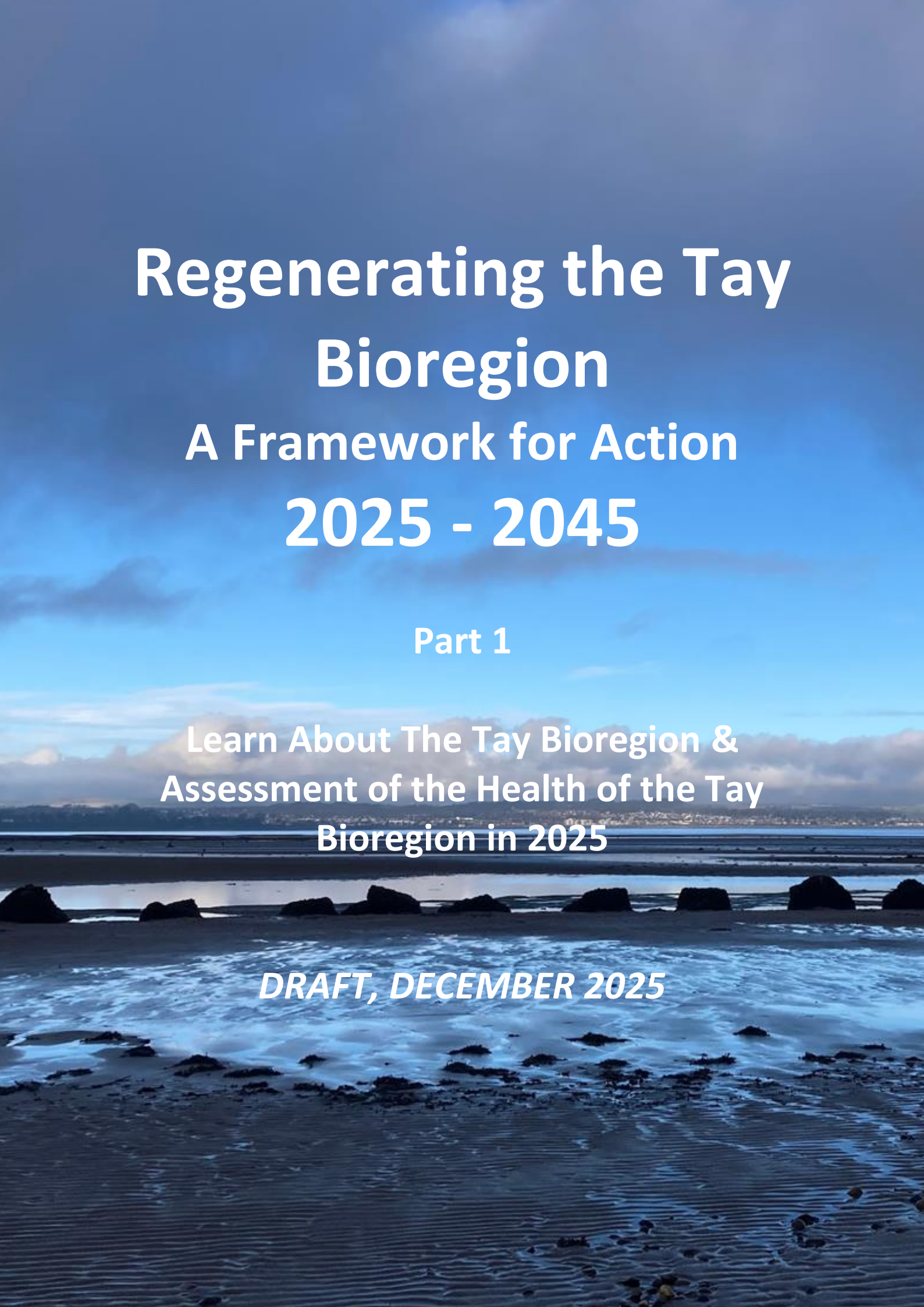

Regenerating the Tay Bioregion

A Framework for Action

2025 - 2045

Part 1

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

DRAFT, DECEMBER 2025

Bioregioning is a place-based biophysical[1] and cultural response to the planetary crises[2] we are facing. It re-invigorates and restores how we humans think about our presence on this planet and how we act, because it challenges us to see a geographic area – our place – through its natural systems instead of the infrastructure humans have designed – turning shires and cities into biomes and watersheds.

Through this work we aim to create opportunities for the people of the Tay Bioregion to re-perceive their interdependence with the natural world and take the urgent action needed to bring human and biotic communities back into a healthy, balanced co-existence with each other.

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[1] Biophysics is an interdisciplinary science that applies the principles and methods of physics, chemistry, and mathematics to understand biological systems

[2] the interconnected challenge of climate change, biodiversity loss, and pollution that threatens ecosystems, human health, and the planet's future

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 1

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

Contents

1. Executive Summary

Regenerating the Tay Bioregion: A Framework for Action (2025–2045) presents the first comprehensive bioregional strategy for ecological and cultural renewal within the Tay River System of Scotland. The Framework recognises this bioregion as an interconnected living system - spanning land, water, biotic and human communities - and aims to guide the transition from extractive, fragmented practices to regenerative, place-based stewardship.

This document (Part 1 of 3) provides the foundational knowledge for understanding the Tay Bioregion and assessing its current ecological and social health. Parts 2 and 3, to follow, will address strategic opportunities and governance and financing mechanisms for regeneration.

Purpose and Vision

The Framework proposes a **bioregional approach** to regeneration - one that integrates ecological restoration, community wellbeing, and economic resilience. It treats the Tay Bioregion not as a set of human designed administrative zones but as a coherent living system defined by the **Tay River System**[3], encompassing 7,163 square kilometres from the Highlands to the North Sea.

Its core ambition is to realign human prosperity with the integrity of natural systems. It promotes regenerative land use, biodiversity protection, localised food and energy systems, and community-led governance to ensure that future development enhances, rather than undermines, the bioregion's ecological base.

The Framework acknowledges that healthy bioregions form the essential infrastructure for a liveable planet. In the context of climate breakdown, biodiversity loss, and social fragmentation - the polycrisis - regeneration is presented not as an optional cost but a necessary foundation for economic and cultural resilience.

Why Bioregioning Matters

Bioregioning is both an ecological and cultural practice of re-inhabiting place - learning to live in ways attuned to local landscapes, watersheds, and histories. It challenges the dominance of political and economic abstractions, asking instead: *what does the land itself require to thrive, and how can humans belong within its limits?*

The Tay Bioregion's approach draws on systems thinking, viewing forests, soils, rivers, and communities as interdependent parts of a single living matrix. This perspective enables integrated solutions - where soil regeneration improves water retention, which enhances biodiversity, which supports food security and social wellbeing.

Globally, bioregioning is part of a growing movement linking local ecological restoration with community empowerment. The Tay initiative aligns with networks such as the **Bioregional**

[3] See definition of the Tay River System here. The Tay Bioregion's boundary is based on this.

Weaving Labs[4] and the **Bioregions of the North Atlantic Isles**, situating Tayside within an international dialogue on living "indigenous to place."

Structure of the Framework For Action

The Tay Bioregional **Framework For Action** is structured as follows:

- **Part 1:** Understanding the Tay Bioregion – its land, water, biotic and human systems – and assessing current health (**this document**).
  Part 2: Opportunity Analysis and Strategic Directions – outlining pathways, transition scenarios, and illustrative regenerative projects over 5, 10, and 20 years.
- **Part 3:** Governance, Collaboration and Finance – designing institutional and financial systems to sustain long-term regeneration.

The Tay Bioregion: A Living System

The Tay Bioregion encompasses diverse geologies, ecologies and communities, unified by the River Tay System. From the Highland Boundary Fault to the fertile lowlands of Strathmore and the Carse of Gowrie, it includes upland moors, forests, farmlands, lochs, rivers and estuaries. These natural systems underpin one of Scotland's most productive agricultural regions, a globally significant freshwater ecosystem, and a human story that goes back c8,000 years.

Land - The Living Foundation

The region's geology - Dalradian metamorphic rocks in the Highlands and younger sedimentary layers in the Lowlands - has shaped its topography, soils, and land use. Its fertile lowlands are among Scotland's most productive, while upland areas support rough grazing and peatland. However, centuries of intensive agriculture, deforestation, and estate consolidation have fragmented habitats, eroded soils, and restricted land access.

Regenerative land practices - such as agroecology, rewilding, and mixed-use forestry - are identified as critical to restoring soil fertility, carbon storage, and landscape resilience.

Water - The Circulatory System

The River Tay, Scotland's largest river by volume, flows eastward through multiple catchments, lochs and tributaries. Its system sustains biodiversity of international importance, including **Atlantic salmon, otter, freshwater pearl mussel**, and **lamprey**. Yet water quality and flow patterns have been heavily modified by hydropower, agricultural runoff, and urbanisation.

The framework highlights the need for integrated catchment management - restoring natural hydrology through riparian replanting, wetland regeneration, and sustainable farming - to strengthen both ecological and community resilience against climate-driven flooding and drought.

Biotic Communities - The Web of Life

[4] Bioregional Weaving Labs

The Tay Bioregion's ecosystems range from **montane heaths and peatlands** in the north to **lowland farmlands, ancient woodlands, wetlands and coastal habitats** in the south and east. Despite high conservation value - 20% of the catchment is under ecological designation - biodiversity has declined sharply due to monoculture farming, invasive species, and climate stress.

Flagship species such as the **red squirrel, golden eagle, beaver, freshwater pearl mussel, and bearded tit** represent the bioregion's ecological wealth and vulnerability. Reconnecting fragmented habitats, increasing native woodland cover (currently 16%), and restoring degraded peatlands are central to regeneration.

Old Man's Beard Lichen on Alyth Hill, photo Clare Cooper

Human Communities – Participants in the System

The region's c416,000 residents are concentrated in **Dundee, Perth, Angus and northern Fife**, with a third in Dundee alone. Rural depopulation, an ageing population, and unequal land ownership constrain local resilience. Yet there is also a strong network of **24 Community Development Trusts** pioneering local energy, housing, and land initiatives.

Historically, the Tay Bioregion has been a crucible of cultural innovation - from Pictish kingdoms and monastic agriculture to the Scottish Enlightenment and industrial Dundee. Its story reflects cycles of connection and disconnection between people and land: from communal stewardship to enclosure and industrialisation, and now toward potential reconnection through community-led regeneration.

Challenges Identified (2025 Health Assessment)

The assessment of the Tay Bioregion's current health reveals **intertwined ecological and social stressors**:

- **Land degradation** through soil erosion, overgrazing, and monoculture, reducing fertility and biodiversity.
- **Water degradation** from agricultural runoff, hydroelectric alterations, and urban pollution.
- **Biodiversity loss** due to habitat fragmentation and climate change impacts on keystone species.
- **Inequitable land ownership**, with large estates dominating and limiting community control.
- **Socioeconomic vulnerability**, including depopulation of rural areas and limited affordable housing.
- **Climate change threats**, particularly increased flooding, peatland drying, and shifting species ranges.

Despite these pressures, the region also shows strong regenerative potential: ecological restoration and rewilding projects small and large, regenerative agriculture, local food movements, renewable energy projects, waste recycling and collaborative governance experiments are already underway.

From Vision to Action

The framework translates bioregional principles into **ten areas of practical intervention**:

- **Land use change** that restores ecosystem function and biodiversity.
- **Watershed restoration** and nature-based flood management.
- **Agro-ecological farming** through soil regeneration, biodiversity uplift and reduced chemical inputs.
- **Expansion of native woodland** especially of upland and riparian zones.
- **Renewable energy systems** integrated with landscape-scale ecological planning.
- **Circular and local economies** to reduce material throughput and build food security.
- **Place-based cultural and educational renewal** that celebrates human inter-connectedness with nature and reorients identity and learning toward local ecosystems.
- **Community governance** that devolves decision-making to catchment and bioregional scales.
- **Just Transition frameworks** ensuring fair social and economic adaptation.
- **Long-term monitoring** of ecological and cultural health indicators.

A Call to Reconnection

The Tay Bioregion **Framework For Action** extends a moral and cultural invitation: to reimagine progress not as endless growth but as *reciprocity with place*.

It argues that regeneration requires both ecological repair and cultural renewal - healing the relationship between people and their environment through attention, care, and collaboration.

It positions the Tay Bioregion as both a **model and a movement** - a living laboratory for bioregional regeneration that could inspire similar transitions across Scotland and beyond.

It calls on all who live within it to re-perceive themselves as part of the land's living systems and to co-create a regenerative future rooted in care for place. As regenerative thinker Pamela Mang says: "Love of place unleashes the personal and political will needed to make profound change."

Its success will depend on sustained collaboration among citizens, landowners, businesses, local councils, scientists, and artists, and on measuring success not in GDP but in the health of soils, rivers, and communities.

In essence, *Regenerating the Tay Bioregion 2025–2045* is a roadmap for transforming one of Scotland's great watersheds into a thriving, resilient landscape of life - socially just, ecologically rich, and culturally grounded.

Millenniums of change: The late Neolithic (c3,000 – c 2,500 BC) Park Neuk Stone Circle near Alyth with Drumderg Windfarm (2008) in the background, photo Clare Cooper