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Bioregional Knowing, Stewardship & The PG Ledger

How Places Learn

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EDITORIAL NOTE

The Green Paper Series is a quiet publication layer: working notes, field notes, and slow investigations rather than closed final products. This paper follows the same form — offered not as a finished model, but as an invitation to explore how communities, landscapes, and institutions might cultivate the forms of intelligence required for long-term regeneration.

AUTHOR'S NOTE — AI CO-CREATION

This paper was drafted in dialogue between Lars A. Engberg and AI language systems under the Sophia Lumen Protocol — a human–AI co-authorship practice, not an autonomous AI author. Responsibility for all substantive claims, omissions, and interpretations rests with the author. The final, consequential judgment is held by a named human.

ABSTRACT

Abstract

Many of humanity's most pressing challenges are approached through intervention. A problem is identified, resources are mobilized, a solution is delivered, and outcomes are measured.

This logic has produced remarkable achievements. Millions of people have gained access to water, sanitation, healthcare, education, energy, and financial services through interventions designed to address specific needs.

Yet a growing number of ecological and social crises reveal the limitations of intervention alone. Watersheds continue to degrade. Biodiversity continues to decline. Soil systems weaken. Communities become increasingly dependent upon external expertise and external funding. Solutions often succeed while the underlying conditions that created the problem remain unchanged.

This paper explores a complementary proposition: *what if the next phase of development is not primarily about delivering solutions, but about increasing the capacity of communities and landscapes to perceive, learn, coordinate, and regenerate together over time?*

We propose the concept of *Bioregional Knowing* as a foundation for stewardship-based governance, and introduce the *PG Ledger* as a cumulative, auditable, and correctable architecture for collective observation and learning.

The Limits of Intervention

Intervention asks practical and necessary questions. What problem must be solved? What resources are required? How can implementation be accelerated? How can impact be measured?

These questions have enabled extraordinary achievements. Yet intervention often treats symptoms and conditions separately.

A water project may improve access to water while watershed health continues to decline. An agricultural project may increase yields while soil fertility decreases. A conservation project may protect biodiversity while local stewardship capacity weakens.

The challenge is not that interventions fail. The challenge is that interventions alone cannot generate the long-term intelligence required for living systems to regenerate.

From Intervention to Stewardship

Stewardship begins from a different question. Rather than asking how a problem can be solved, stewardship asks how a place becomes capable of caring for itself.

This shift moves attention from projects to capacities, from outputs to relationships, from transactions to learning, and from isolated metrics to living systems.

Stewardship is therefore not an alternative to development. It is a deeper layer beneath development.

The central unit is no longer the project. The central unit becomes the continuing relationship between people and place.

What Is Bioregional Knowing?

Bioregional Knowing is the collective capacity of people living within a place to perceive, understand, and respond to the conditions that shape life within that place.

This includes awareness of ecological processes such as water cycles, soil health, biodiversity, and food systems, but also awareness of social trust, governance capacity, cultural memory, economic viability, and steward well-being.

No single institution can hold this knowledge. No single dataset can represent it. It emerges through observation, participation, dialogue, correction, and practice.

Bioregional Knowing is therefore not merely information. It is a living relationship between people and place.

The ideas presented in this paper do not emerge from theory alone. They are informed by ongoing stewardship experiments and citizen science practices across diverse contexts, including field relationships in Uganda, Morocco, Mexico, and Denmark. The purpose of these initiatives is not to validate a predetermined model, but to explore whether communities can gradually strengthen their capacity to observe, learn from, and steward the living systems upon which they depend.

To perceive a place from outside is not the same as to know it. A reading made at a distance can sharpen a question, but it can also distort what it claims to see if it is mistaken for understanding. Bioregional Knowing therefore belongs first

to those who live within a place; any outside reading remains a way of asking, never a verdict.

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Knowing as a Correctable Practice

A central premise of the Planetary Guardians field is that stewardship does not emerge from certainty. It emerges from the capacity to notice error.

Every observation is partial. Every model is provisional. Every landscape contains surprises.

The goal is therefore not perfect knowledge. The goal is continuously improving judgment.

The strength of a stewardship system is not that it never makes mistakes. Its strength is that mistakes become visible, discussable, and correctable. This principle distinguishes stewardship from technocratic optimisation.

Reality retains the final vote. No protocol outranks honest field contradiction.

Citizen Science as Civic Infrastructure

Citizen science is often understood as a method for collecting data. In a stewardship context it becomes something more. It becomes a civic practice.

A community that observes together learns together. A community that learns together gains the ability to act together. Observation therefore serves not only measurement but also social coherence. The process itself strengthens stewardship.

Within the Planetary Guardians field, this often takes place through local circles of practice. One working hypothesis is the Circle of 13: a group large enough to contain diversity of experience and perspective, yet small enough to sustain trust, continuity, and mutual accountability. Such circles are not governance authorities in themselves. They are learning structures through which stewardship capacity can emerge and mature.

Citizen science thus becomes part of the governance architecture of a place.

The Pixel: A Unit of Attention

Bioregional Knowing requires units of observation that are both simple and comparable. Borrowing the language of digital imagery, the pixel serves as a small, repeatable unit of observation within a larger field of stewardship.

The current prototype uses 10 m² observation plots organised within a 13 × 13 matrix consisting of 169 pixels. Each pixel becomes a place where people can repeatedly observe and document:

- Soil conditions
- Water retention
- Vegetation
- Biodiversity
- Food production
- Human activity
- Stewardship practices

The purpose is not scientific certainty. The purpose is cumulative learning. Over time, thousands of observations create a distributed memory of changing conditions across landscapes and communities.

The Question Beneath the Metrics

The architecture is intentionally simple. Beneath all measurements lies a single orienting question:

Is this practice giving to life or taking from it?

This question is explored through multiple observational categories. No single metric can answer it. The answer emerges from patterns observed across ecological, social, economic, and governance dimensions.

The role of measurement is therefore not to replace judgment. It is to support judgment.

The PG Ledger

The PG Ledger was conceived as a response to a missing layer in contemporary governance. Most systems monitor financial performance, project outputs, economic activity, and infrastructure delivery. Far fewer systems monitor steward viability, community learning, ecological regeneration, and long-term relational capacity.

The PG Ledger is not primarily a financial ledger. It is a stewardship ledger. Its purpose is to help communities accumulate, organise, audit, and learn from living evidence. Ledger entries may include observations, photographs, narratives, measurements, field reports, stewardship actions, and documented outcomes.

A simple example illustrates the principle. A steward records that a newly established planting corridor failed during an unusually dry season. The entry is not removed when the effort proves unsuccessful. Instead, the observation remains visible, is annotated with later reflections, and becomes part of the collective memory available to future stewards. Learning accumulates through transparent correction rather than through the appearance of success.

The Ledger functions as a cumulative memory rather than a command system. It does not decide.

It helps communities remember.

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The Principle of Non-Compensation

The Ledger is organised around three visible streams.

- *Stream A* — Land, ecology, biodiversity, water, and living systems.
- *Stream B* — Steward viability and human capacity.
- *Stream C* — Coordination, governance, learning, and collective action.

The streams are intentionally non-compensating. A thriving ecosystem cannot compensate for exhausted stewards. Strong governance cannot compensate for ecological decline. Financial activity cannot compensate for the erosion of stewardship capacity.

In the current architecture, severe degradation in Stream B pauses further ecological expansion efforts until steward viability is restored. Ecological ambition must not be financed by human depletion.

The principle extends beyond budgets. It is an epistemological commitment. One form of value cannot erase another form of reality.

Steward Viability and the Instrument of Knowing

A distinctive premise of the Planetary Guardians field is that the observer is not separate from the observation.

Stewardship depends upon human perception, judgment, and attention. These capacities are influenced by fatigue, stress, trauma, health, relationships, and the wider conditions of life.

An exhausted steward does not merely suffer personally. An exhausted steward may also observe less accurately. For this reason, steward viability is not only an ethical concern. It is an epistemological concern. Trustworthy perception depends upon viable observers.

This insight forms part of the broader Moral Biology inquiry: the recognition that human nervous systems are themselves part of the stewardship instrument. A system that exhausts its observers gradually loses its ability to know the reality it seeks to steward.

Polycentric Stewardship

As stewardship capacities mature, communities naturally begin to connect. Knowledge travels. Practices spread. Patterns become visible across regions. This creates the possibility of federated stewardship networks.

The intellectual lineage of this approach draws partly from polycentric governance traditions associated with Elinor Ostrom and Vincent Ostrom.

Local autonomy remains local. Learning becomes shared. Decision-making remains distributed. The result is neither centralisation nor fragmentation. Multiple centres of stewardship become capable of learning together while retaining local authority.

AI and the Boundaries of Stewardship

Artificial intelligence may assist stewardship in important ways. AI can help detect patterns, organise observations, support synthesis, increase accessibility, and accelerate translation across languages and contexts.

However, AI does not possess stewardship responsibility. AI does not bear consequences. AI does not inhabit places. AI does not exercise moral judgment.

For this reason, human authority over stewardship decisions remains a structural requirement. This is not a matter of caution alone. It reflects a distinction the Planetary Guardians field holds throughout: between what a tool can do and who remains accountable for what is done. Functional capacity is not moral agency. The responsibility for a place is always held by a named human.

Artificial intelligence may assist observation and interpretation. It does not replace responsibility.

Scaling Capacity Rather Than Outputs

Conventional development often asks how solutions can scale. Stewardship introduces a different question: how can the capacity of places to learn and regenerate scale?

This is not primarily a question of replication, nor of centralisation. It is a question of participation.

The distinction matters. To scale outputs is to reproduce a single model across many sites, with the centre defining what counts as success. To scale capacity is to strengthen the ability of each place to perceive and steward its own living systems, on its own terms.

Places do not become branches of a centre. Places meet as equals. Learning travels. Authority remains local.

The vessels fill simultaneously.

Conclusion

The ecological crises of our time are not only crises of resources. They are also crises of perception.

Human societies possess extraordinary abilities to count, finance, build, and optimise. What remains underdeveloped is our collective capacity to see the living systems upon which these activities depend.

Bioregional Knowing proposes that stewardship begins with learning to perceive those systems together. The PG Ledger is offered as one possible contribution to that effort — not as a final model, not as a universal framework, but as an invitation to explore how communities, landscapes, and institutions might cultivate the forms of intelligence required for long-term regeneration.

The central question remains simple:

What becomes possible when people learn to observe, understand, and steward a place together over time?

And perhaps equally important:

What becomes possible when communities become better at learning from reality than defending their assumptions?

HOW TO CITE THIS PAPER

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Where this paper speaks in the first person plural, it refers to the Planetary Guardians field — a body of thinking and practice and its lineage — not to an organisation speaking on behalf of others. Communities and partners working in particular places speak for themselves.

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