FREEHOLD ADVISORY

Portfolio Complexity in Ecological Restoration

Early Findings from a Multi-Source Diagnostic Framework

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Executive Summary

Ecological restoration organizations in Washington State manage portfolios of funded obligations across multiple federal, state, and local programs. These funding sources operate independently. Each tracks its own awards, timelines, and reporting requirements. No single source sees the full picture of what an entity is managing.

This paper introduces the Restoration Portfolio Analysis Framework (RPAF), a diagnostic approach that assembles 16 public data sources into a unified view of portfolio structural complexity. The framework computes a Portfolio Complexity Score (PCS) for each entity and maps structural conflicts through Parallel Project Conflict Maps (PPCM).

> Across a benchmark dataset of 50 Pacific Northwest restoration entities, I find that approximately 80% have at least one structural portfolio conflict: overlapping timelines, competing match commitments, or converging obligations across funding sources. While most conflict entities would be flagged from their largest single data source alone, the complete structural picture only emerges when the sources are connected.

These are early findings from a purposive benchmark dataset. They describe structural patterns, not organizational quality. Portfolio complexity is not inherently problematic. It often reflects the trust that multiple funders place in an entity's capacity. This framework makes that complexity visible so organizations and their stakeholders can see the whole portfolio, together.

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1. Introduction: The Invisible Complexity

How does a restoration organization know when its grant portfolio is structurally complex?

A salmon recovery entity in western Washington might manage obligations from the Recreation and Conservation Office, the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, and several tribal co-management agreements, all simultaneously. Each funding source tracks its own awards. Each has its own reporting timeline. Each sees its own slice of the entity's workload.

The entity itself may track these obligations in separate systems, or in a single spreadsheet, or in the institutional memory of a program manager. What none of these views provides is a structural picture of how the obligations interact: where timelines converge, where match commitments compound, where reporting deadlines cluster, and where funding from different sources overlaps in scope and geography.

This paper introduces a framework for assembling that structural picture from publicly available data. The Portfolio Complexity Score (PCS) is a composite metric that quantifies how structurally complex an entity's active portfolio is to manage. The Parallel Project Conflict Map (PPCM) identifies specific patterns of structural interaction between obligations.

I apply this framework to a benchmark dataset of 50 ecological restoration entities in Washington State and present early findings on the prevalence and character of structural portfolio complexity in this sector.

> I make no causal claims. I do not assert that complexity causes poor outcomes, nor that simpler portfolios produce better results. Across the 38 entities for which I have both PCS data and salmon population trends, the correlation between portfolio complexity and ecological decline is r = -0.112, effectively zero. This framework is diagnostic, not predictive. It shows what a portfolio looks like. What that means is for the entity and its stakeholders to decide.

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2. Background

The PNW Restoration Sector

Washington State's ecological restoration sector encompasses tribal governments, land trusts, salmon enhancement groups, conservation districts, and county agencies working across 62 Water Resource Inventory Areas (WRIAs). Federal funding flows through programs like the Pacific Coastal Salmon Recovery Fund, NOAA Fisheries, and the EPA National Estuary Program. State funding flows primarily through the Recreation and Conservation Office (RCO) and the Salmon Recovery Funding Board. Many entities also carry significant match commitments funded through private donations, endowments, or local government contributions.

Existing Approaches and Their Limitations

Current approaches to understanding organizational portfolio complexity are largely self-reported or single-source. Grant management systems track individual awards. Federal databases like USASpending.gov track federal obligations. State systems like RCO's PRISM database track state-funded projects. None assembles the full portfolio across sources.

Capacity assessments, whether conducted by funders evaluating applicants or by organizations evaluating themselves, typically rely on revenue, staffing, and organizational age. These are useful indicators but do not capture the structural interactions between funded obligations.

Academic Foundations

This framework draws on several established methodologies. Funder concentration is measured using the Herfindahl-Hirschman Index (HHI), a standard metric in antitrust economics used by the U.S. Department of Justice and Federal Trade Commission. Revenue portfolio risk research by Qu (2019) demonstrates that nonprofit funding diversification patterns affect organizational stability. The Bridgespan Group's research on nonprofit funding models (2024) provides context for how different organizational types manage growth and funding concentration. The Taskforce on Nature-related Financial Disclosures (TNFD) LEAP framework offers a structured approach to assessing nature-related dependencies and impacts. A recent collaborative research agenda for restoring free-flowing rivers (Stoffers et al., 2026) identified "developing prioritization strategies for targeted restoration" as the second-highest global research priority among 237 experts, with governance and multi-scale coordination ranking as high as ecological topics. Andrews, Pritchett, and Woolcock (2017) describe how institutions can adopt the outward forms of functional organizations — reporting templates, compliance systems, organizational charts — while the structural coherence to perform remains absent, a pattern they term "isomorphic mimicry." The gap between what individual reporting systems show and what multi-source assembly reveals is analogous: each funder's view looks coherent; the assembled view exposes structural interactions none of them were designed to detect. Cash, Clark et al. (2002) argue that information produced for decision-making must satisfy three conditions simultaneously — salience, credibility, and legitimacy — a framework that informed the design of the truthfulness infrastructure underlying this analysis. Freehold's editorial approach is structurally inspired by Norges Bank Investment Management's expectations methodology: observing and contextualizing without prescribing action.

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3. Methodology

3.1 Data Assembly

The framework assembles data from 16 publicly accessible sources across five layers:

Layer	Sources
Federal financial	USASpending.gov, Grants.gov, SAM.gov
State project	RCO PRISM, RCO ArcGIS
Organizational	ProPublica Nonprofit Explorer (IRS 990s), IRS Business Master File, Federal Audit Clearinghouse
Ecological	NOAA SHSTMP (habitat), USGS Water Services (hydrology), WDFW Chinook escapement data
Regulatory & programmatic	EPA ECHO, Puget Sound Partnership Action Agenda, NEP Atlas, USGS PAD-US, WDFW Fish Passage Barrier Inventory

Obligation records from the three portfolio sources (USASpending, RCO PRISM, RCO ArcGIS) are deduplicated using a 5% amount tolerance with date overlap verification. Ecological and regulatory data are joined at the WRIA level, the watershed boundary system used throughout Washington State.

All data is retrieved from public APIs or published datasets. No proprietary, self-reported, or restricted-access data is used. Not all enrichment sources apply to all entity types: tribal governments do not file IRS 990s, and land trusts do not operate EPA-regulated facilities. The contextual picture varies by organizational type. This asymmetry is structural, not a data gap (see Section 4.4).

3.2 Portfolio Complexity Score (PCS)

The PCS is a composite metric (0-100) computed from normalized factors spanning portfolio scale, diversity, temporal density, and capacity pressure:

Factor	What it measures
Active obligation count	Number of currently active funded obligations
Total portfolio value	Sum of primary amounts across active obligations
Funder concentration (HHI)	Dependence on a single funding source
Concurrent obligations	Maximum simultaneous obligation overlap
Match burden ratio	Cost-sharing commitments as a fraction of portfolio value
Unique funding sources	Number of distinct funding programs
Unique awarding agencies	Number of distinct funding agencies
Federal vs state ratio	Balance between federal and state funding
Type balance ratio	Diversity of obligation types (restoration, acquisition, planning)
Portfolio velocity	Fraction of obligations started in the trailing 24 months
Average obligation duration	Mean length of active obligations
Obligations-to-revenue ratio	Portfolio size relative to annual revenue

Factor weights are being developed for the PNW restoration sector, informed by practitioner input and iterative testing. The current calibration classifies entities into four tiers: MINIMAL (PCS < 20), LOW (20-44), MODERATE (45-74), and HIGH (75+). In the current benchmark, only the LOW and MODERATE tiers are populated (see Section 4.1). These weights and thresholds are subject to revision as the benchmark expands and external validation is conducted.

PCS measures structural complexity: the number, diversity, and interaction of funded obligations. It does not measure organizational quality, management competence, or program effectiveness. A high PCS reflects the structural demands of a large, diverse portfolio, not a judgment about the entity managing it.

3.3 Parallel Project Conflict Map (PPCM)

The PPCM identifies five types of structural conflict between obligations:

Conflict type	Definition	Threshold
Concurrent typed	3+ obligations of the same type active simultaneously	Count >= 3
End-date cluster	3+ obligations with end dates within 90 days	90-day window
High match burden	Match commitments exceed 30% of portfolio value	30% threshold
Cross-source overlap	Obligations from different funding sources overlapping in time and scope	2x size ratio
Type-geographic overlap	Same-type obligations overlapping in the same WRIA	Geographic match

These conflict types are not failures. End-date clusters in salmon restoration, for example, often reflect the sector's seasonal construction calendar. In-water work windows typically run July through September, creating natural deadline convergence. The PPCM surfaces these patterns; interpretation depends on context.

3.4 Sample

The benchmark dataset comprises 50 publishable entities selected from Washington State's ecological restoration sector. Selection criteria: (1) presence in RCO's PRISM project database, indicating state-level restoration engagement, and (2) federal data presence in USASpending.gov or SAM.gov. One additional entity is excluded from publication due to data quality concerns.

The sample is purposive, not random. It was constructed to span the sector's organizational diversity:

Entity type	Count	%
Tribal government	13	26%
Land trust / conservancy	12	24%
Other (foundations, cooperatives, commissions)	10	20%
Salmon enhancement group	8	16%
Conservation district / county government	7	14%

This is a benchmark dataset, sufficient to demonstrate that the framework produces meaningful differentiation and to identify structural patterns. It is not sufficient to establish population-level norms for the sector.

4. Findings

The findings are organized in three blocks: what the framework reveals about the sector (4.1-4.3), how the patterns are structured (4.4-4.5), and what this tells us about the framework itself (4.6-4.8).

WHAT MULTI-SOURCE ASSEMBLY REVEALS

4.1 Portfolio complexity spans a wide range

> PCS scores across the benchmark range from 27 to 71, with a median of 48. The distribution clusters in the LOW (36%) and MODERATE (64%) tiers. No entities score in the MINIMAL or HIGH tiers with the current threshold calibration.

Entity A, a tribal government, manages more than 40 active obligations across federal and state sources with a PCS in the upper 50s. Entity B, a land trust, manages 9 active obligations primarily from RCO with a PCS of 46. Both are in the MODERATE tier, but their portfolios look very different. Entity A's complexity comes from obligation volume and source diversity, while Entity B's comes from high match burden and funder concentration.

Active obligation counts range from 1 to over 500, with a median of 9 among the 38 entities with reliable active-status data. The most discriminating PCS factor is active obligation count (coefficient of variation = 2.19), followed by obligations-to-revenue ratio (CV = 1.87) and total portfolio value (CV = 1.80).

Active obligation count and total portfolio value are highly correlated (r = 0.90), suggesting some redundancy between these factors. Future calibration work may adjust their relative weights.

4.2 Structural conflicts are prevalent but not universal

Across the 50 publishable entities, 40 (80%) have at least one structural conflict type detected by the PPCM. The 95% confidence interval for this proportion is 69% to 91%.

Ten entities (20%) have zero detected conflicts. Most of these are smaller organizations with fewer active obligations and single-source funding. The framework discriminates and does not flag everything. However, at least two conflict-free entities manage 39 and 44 active obligations respectively. These entities have very few obligation end dates in their source records (1-2 out of 39-44), which prevents the PPCM from detecting temporal patterns. Their conflict-free status reflects data sparsity, not portfolio simplicity. The 80% conflict rate may therefore understate true prevalence.

End-date clustering is the most common conflict type (58% of entities), followed by cross-source overlap (46%), concurrent typed obligations (32%), high match burden (32%), and type-geographic

overlap (12%).

4.3 What multi-source assembly adds, and what it does not

Among the 40 entities with structural conflicts, 27 (68%) have conflicts that span multiple data sources. Twenty-three entities have cross-source overlaps: obligations from different funding programs that interact in ways invisible from any single funder's perspective.

There is a nuance here worth noting. If I ask not "which conflict types span sources?" but "which entities would still be flagged from their largest single source alone?", the answer is 33 of 40 (82%). Most entities with conflicts have enough within-source patterns (concurrent typed obligations, end-date clusters, or high match burden) that a single-source analysis would detect something.

What multi-source assembly uniquely reveals is not that conflicts exist (most are detectable within individual sources) but what *kind* of conflicts exist. Cross-source overlap, by definition, can only be detected when sources are connected. And the complete structural picture, such as the interaction between a federal timeline overlap and a state-funded match commitment, only emerges from the assembled view. Entity C, an enhancement group, appears manageable from its federal awards alone: a handful of federal obligations with well-spaced timelines. When state RCO projects are added, the picture changes: more than 20 active obligations, 3 structural conflict types, and a match burden well above the median. The conflicts were real but invisible until the sources were connected.

The value of multi-source assembly is not in detecting more entities with conflicts. It is in revealing the full structural picture for entities that would otherwise appear simpler than they are.

HOW COMPLEXITY IS STRUCTURED

4.4 Entity types have distinct conflict profiles

Different organizational types exhibit characteristically different conflict patterns:

Entity type	Conflict rate	Dominant conflict type	Interpretation
Tribal government	85%	End-date cluster (85%)	Seasonal fish window constraints drive deadline convergence
Land trust / conservancy	83%	High match burden (67%)	Acquisition-heavy portfolios require significant cost-sharing
Enhancement group	75%	High match burden (75%)	Grant-funded restoration carries substantial match requirements
District / county	86%	Cross-source overlap (57%)	Government entities span multiple funding programs
Other	70%	Cross-source overlap (50%)	Diverse organizations with multi-source portfolios

These profiles are not evaluative. A tribal government's end-date clustering reflects the ecological reality of salmon life cycles and regulatory work windows, not a planning failure. A land trust's high match burden reflects the acquisition funding model, where private donations leverage public grants. The framework describes structural patterns; their significance depends on organizational context.

The enrichment data that contextualizes these profiles is also asymmetric by entity type, but this reflects genuine structural differences, not data gaps. Tribal governments do not file IRS 990 returns (they are sovereign governments, not tax-exempt nonprofits), so financial trajectory data is unavailable for them. Conversely, land trusts do not operate regulated facilities, so EPA compliance data is inapplicable. Land trusts hold conservation easements visible in the Protected Areas Database; enhancement groups and tribes generally do not. Tribes are deeply embedded in Puget Sound Partnership recovery programs; smaller land trusts may not be. The enrichment dimensions that populate for each entity type reflect how that type actually operates. The diagnostic picture is genuinely different across types, richer in ecological and programmatic context for tribes, richer in financial and organizational context for nonprofits.

4.5 Conflict types interact

Conflict types do not occur independently. Among the 40 entities with detected conflicts, 15 (38%) carry three or more types simultaneously, and 7 carry all four non-geographic types at once. Two interaction patterns are notable.

First, some conflict types attract each other beyond what chance would predict. Concurrent typed obligations and type-geographic overlap co-occur at roughly twice the expected rate. This is intu-

itive: if an entity runs three or more restoration projects of the same type, they are likely concentrated in the same watershed because that is where the entity works. These are two views of the same structural pattern, concentrated effort in one area.

Second, some conflict types create genuine tension. An entity with both deadline clustering and high match burden faces a tradeoff: spreading projects across more of the year could reduce reporting convergence, but would extend the period over which match commitments are carried. An entity with both high match burden and cross-source overlap may face compounding cost-sharing requirements, where each funding source requires independent match. These are not additive problems. They interact.

The entities carrying the most interacting conflicts tend to be salmon enhancement groups operating in watersheds with declining Chinook populations. Entity D, an enhancement group with a PCS in the high 60s, manages multiple simultaneous conflict types while a majority of the Chinook populations in its operating watersheds are declining. The structural complexity of its portfolio and the ecological pressure on its watersheds are not causally linked (Section 4.6), but they describe the same operating reality from different angles.

> One environmental variable does differentiate high-conflict entities: fish passage barriers. Entities with 4 conflict types operate in watersheds with a median of roughly 1,800 known barriers; entities with zero conflict types operate in watersheds with a median of roughly 500, a 3.5x difference. Other ecological indicators (Chinook population trends, water quality impairments) do not show the same gradient. The barrier finding makes intuitive sense: more barriers mean more fish passage projects, which generate more funded obligations, which create more structural interactions. Portfolio complexity is not caused by ecological pressure in general, but the specific, physical work of addressing barrier-dense watersheds manifests as portfolio structural complexity. The scale of the restoration challenge and the complexity of the portfolio that addresses it are, in this dataset, two descriptions of the same underlying reality.

WHAT THIS TELLS US ABOUT THE FRAMEWORK

4.6 Complexity does not predict ecological outcomes

> Across the 38 entities for which I have both PCS data and Chinook salmon population trends (9-year natural-origin spawner escapement data from WDFW monitoring), the correlation between PCS and the percentage of declining populations is r = -0.112 (n = 38).

This is effectively zero. Portfolio complexity does not predict whether the fish populations in an entity's watershed are improving or declining.

This finding matters for positioning the framework correctly. PCS measures the structural demands of a portfolio. It is not designed to infer organizational effectiveness or ecological impact. An entity with PCS 65 and declining salmon populations is not less effective because of its complexity. An entity with PCS 30 and improving populations is not more effective because of its simplicity. The portfolio diagnostic and the ecological context are two independent lenses on the same operating reality. For a director managing a complex portfolio, this means that high complexity is not a warning sign. It is often a reflection of the confidence multiple funders have placed in the organization's capacity to do difficult work in difficult places.

4.7 Funding burden and institutional burden are independent

Restoration entities carry burden from two distinct systems: funding programs (federal and state grants that generate obligations, timelines, and match requirements) and recovery planning programs (Puget Sound Partnership Action Agenda commitments, NEP activities, Vital Sign targets). This framework measures both. PCS and PPCM capture funding burden; PSP and NEP enrichment captures institutional burden.

These two systems do not see each other, and the burden they distribute is uncorrelated. The correlation between conflict type count and NEP activity count is $r = 0.041$; between conflict type count and PSP program count, $r = 0.000$. An entity can be institutionally central to Puget Sound recovery, carrying 28 NEP activities, while managing a relatively simple financial portfolio. Another can carry 4 simultaneous conflict types with zero institutional recovery commitments.

In this benchmark, entities with 4 conflict types carry a mean of 11.4 combined PSP/NEP commitments. Entities with zero conflict types carry a mean of 6.3. But entities with 1-2 conflict types carry 9.6, nearly as many as the most structurally complex group. There is no monotonic relationship.

This independence matters because no single view of an entity's workload captures the full picture. A funder evaluating a grant application sees the financial portfolio. A recovery planner evaluating Action Agenda implementation sees the institutional commitments. Neither sees both. An entity carrying a complex portfolio and heavy institutional commitments is navigating demands from two systems that are not coordinating with each other, and no existing tool puts both on the same page.

4.8 PCS captures structural complexity beyond obligation count

A natural challenge to a multi-factor complexity score is whether it adds value over a simple obligation count. If PCS merely counts obligations, 14 factors and a composite scoring methodology are unnecessary overhead.

To test this, I fit a simple linear model predicting PCS from active obligation count alone (PCS = 47.7 + 0.044 x count) and examined the residuals, the gap between what obligation count predicts and what PCS actually scores. If PCS is redundant with count, residuals would be small and random.

They are neither. Entities carrying both high funding burden (above-median conflict types) and high institutional burden (above-median NEP activities) have a mean PCS residual of +14.6, nearly 15 points higher than obligation count alone would predict. Entities with low burden on both dimensions have a mean residual of -6.2. The gradient is monotonic across all four quadrants.

Burden profile	n	Mean PCS residual
High funding + high institutional	8	+14.6
High funding only	7	+7.7
High institutional only	15	-3.1
Low on both	20	-6.2

Entity E, an enhancement group managing fewer than 20 active obligations, scores a PCS in the high 60s, while a count-based prediction would yield roughly 50. The roughly 20-point residual reflects funder diversity, match burden, temporal overlap, and source mix that obligation count cannot capture. These are the structural features that make a moderately sized portfolio more demanding to manage than one of similar size from a single source with staggered timelines.

This finding suggests that PCS is doing meaningful analytical work beyond counting. The entities where the multi-factor approach adds the most value are precisely those carrying burden from multiple independent systems, the dual-burdened entities that no single data source can fully characterize.

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5. Limitations

This work has several limitations that frame how the findings are best interpreted.

Sample size and scope. The benchmark comprises 50 entities in a single state. These findings describe patterns in this dataset. They may not generalize to other geographies or sectors without replication. I use the term "benchmark dataset" deliberately: this is a foundation for future work, not a definitive sector census.

Factor calibration and weight sensitivity. PCS factor weights are being developed for the PNW restoration sector through practitioner input and iterative testing, not empirically derived from outcome data. The choice of weights matters: under four alternative weighting schemes (equal weights,

size-dominant, diversity-dominant, and burden-dominant), entity rankings shift substantially. Only the size-dominant scheme correlates strongly with the current calibration (Spearman rho = 0.73); diversity-dominant and burden-dominant schemes produce near-random reorderings (rho = 0.12 and 0.01 respectively). Between 26 and 31 of 50 entities change tier classification under alternative schemes.

This means the specific PCS score is a function of calibration choices. The current weights reflect developing PNW restoration practitioner judgment about which structural features matter most: obligation count, funder diversity, temporal overlap, and match burden. Different reasonable judgments would produce different scores, and I expect the weights to evolve as the benchmark grows and practitioners provide feedback. The framework's value is in the structural picture it assembles (which factors are elevated, which conflict types are present, how sources interact) rather than in the specific number. PCS is best interpreted as a structured lens, not a precise measurement.

Active filter reliability. Twelve of the 50 entities lack sufficient end-date data to reliably classify obligations as active or completed. These entities are included in conflict analysis (which uses all obligations) but excluded from analyses that depend on active obligation counts. Population-level statistics that reference "reliable" entities use a subset of 38. Additionally, at least two large-portfolio entities appear conflict-free because their obligation records lack end dates and type classifications, preventing temporal and categorical conflict detection. The reported 80% conflict rate likely understates true prevalence.

Data coverage by entity type. PCS is computed from publicly observable obligations (federal awards via USASpending, state projects via RCO PRISM and ArcGIS). Different entity types have additional funding streams that public records do not capture: enhancement groups receive baseline funding from fishing license fees through a dedicated state account; tribal governments manage BIA self-governance compacts and enterprise revenue; land trusts hold endowment income and easement stewardship fees; conservation districts receive property tax and utility fee revenue. These invisible streams mean that PCS reflects the publicly funded portion of an entity's portfolio, not its full operational picture. Funder concentration (HHI) may appear higher than actual concentration for entities with substantial non-public revenue.

Survivorship bias. All entities in the dataset are currently operating. The dataset does not include entities that dissolved, merged, or ceased restoration work. The youngest entity in the dataset has been operating for 18 years. The findings describe the structural reality of surviving organizations.

No external validation. No entity in this dataset has received or reviewed a Freehold diagnostic. I do not yet know whether the structural patterns identified here are recognized as meaningful by the people managing these portfolios. External validation is the next priority for this work.

Data currency. Obligation data reflects the state of public records at the time of retrieval (March 2026). Enrichment data (ecological, regulatory) has varying freshness across sources. The framework

provides a snapshot, not a real-time monitor.

Robustness

> Three foundational properties of the framework were tested for fragility and found to hold. First, the 80% conflict prevalence rate holds across threshold variations: varying concurrent obligation thresholds (3 to 5), end-date window size (45 to 120 days), and match burden threshold (25% to 50%) produces conflict rates between 80% and 84%. The finding is structural, not an artifact of threshold selection. Second, conflict detection is not trivially true: the correlation between obligation count and conflict type count is r = 0.095. Four entities with 10 or more active obligations, including two with 39 and 44, have zero detected conflicts. The PPCM detects structural patterns, not portfolio size. Third, the framework is not circular: PCS, obligation count, and conflict types measure different things (pairwise correlations: PCS vs count r = 0.30, count vs conflicts r = 0.10, PCS vs conflicts r = 0.66).

6. Implications for Practice

For restoration entities

An entity that can see its match burden is in the 75th percentile, or that three reporting deadlines converge in September, has context that was previously unavailable from any single funding source. That context changes the conversation. A director who can show a funder that three other obligations converge in the same quarter is not making an excuse. They are providing the structural picture that the funder's own data cannot see — the picture that makes renegotiating a timeline a shared decision rather than a unilateral request.

The framework does not tell an entity what to do. It shows what the portfolio looks like when all the sources come together. Research on procedural fairness (Tyler, 1990) suggests that people engage with institutional findings — even uncomfortable ones — when they perceive the process as transparent, unbiased, and respectful of their operational context. This is why the framework describes structural patterns without prescribing responses.

For funders

Grant applicants present proposals one at a time. Funders evaluate them one at a time. Neither view captures the applicant's full portfolio context: the other obligations being managed, the match commitments already committed, the timeline pressures already in play.

In this benchmark, 23 entities have structural conflicts that involve obligations from outside any single funder's system. A funder evaluating a new application cannot see these interactions from its own data. The assembled view provides context that individual grant reviews cannot.

For the sector

Structural portfolio complexity is the norm in PNW ecological restoration, not the exception. Eighty percent of entities in this benchmark have at least one detected conflict pattern. This likely reflects the nature of multi-source environmental funding: many programs, many agencies, many timelines converging on the same watersheds and the same organizations.

This prevalence suggests that portfolio structural complexity is a sector-level characteristic worth understanding and discussing, not an individual organizational problem to be solved.

For future work

This benchmark raises questions that a larger dataset could answer. Do these patterns hold across other states? Do other environmental sectors (water quality, habitat conservation, urban restoration) show similar structural profiles? Does portfolio complexity change over time, and if so, does the second diagnostic reveal trends that the first cannot?

Expanding the benchmark, validating findings with practitioners, and building temporal comparison capability are the next priorities.

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7. Conclusion

No single funding source tells the full story of a restoration entity's portfolio. Federal databases see federal awards. State systems see state projects. Neither sees the structural interactions between them.

This paper introduces a framework for assembling that full picture from 16 public data sources and computing structural complexity metrics across a benchmark of 50 Pacific Northwest restoration entities. The early findings suggest that structural portfolio complexity is prevalent (approximately 80% of entities have detected conflicts), that the complete structural picture only emerges from multi-source assembly, and that complexity is characteristically different across entity types.

The framework is diagnostic. It describes structural patterns without evaluating the organizations that carry them. A high PCS score reflects the structural demands of a complex portfolio, often a mark of trust from multiple funders, not a judgment about the entity's capacity to manage it.

These are early findings from a benchmark dataset. The framework exists. The data is assembled. The next step is real conversations with the entities the data describes.

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Appendix A: Data Source Descriptions

Source	Layer	What it provides	Join method
USASpending.gov	Federal financial	Federal award obligations, amounts, dates, agencies	Entity name / UEI
Grants.gov	Federal financial	Open federal funding opportunities	Assistance listing match
SAM.gov	Federal financial	Entity registration, UEI, capability statements	UEI / entity name
RCO PRISM	State project	State-funded restoration project records	Entity name
RCO ArcGIS	State project	Project geospatial data, outcome acres	Project number
ProPublica 990s	Organizational	IRS 990 filing data, revenue, expenses	EIN
IRS BMF	Organizational	Business Master File, ruling year, subsection	EIN
FAC	Organizational	Federal Single Audit findings	EIN
EPA ECHO	Regulatory	Environmental compliance, facility permits	Entity name / location
PSP Action Agenda	Programmatic	Puget Sound recovery program commitments	Entity name
NEP Atlas	Programmatic	National Estuary Program project tracking	Entity name
NOAA SHSTMP	Ecological	Salmon habitat condition, riparian cover	WRIA
USGS Water Services	Ecological	Streamflow, water temperature	WRIA / HUC
WDFW Escapement	Ecological	Chinook spawner counts, 9-year trends	WRIA
WDFW Fish Passage	Ecological	Fish passage barrier inventory	WRIA
USGS PAD-US	Regulatory	Protected areas, conservation easements	Entity name / location

Appendix B: PCS Factor Weights

Factor weights are configured in the sector vocabulary file and are being developed for PNW ecological restoration. The current weights emphasize obligation count, funder diversity, and temporal overlap, the factors most relevant to administrative burden in multi-source restoration portfolios.

Detailed factor weights are available in the sector configuration file. They are informed by practitioner input and subject to revision as the benchmark expands and external validation is conducted.

Appendix C: Conflict Type Thresholds

Conflict type	Threshold	Rationale
Concurrent typed	3+ same-type obligations active	Below 3, concurrent obligations are routine
End-date cluster	3+ end dates within 90 days	90-day window captures quarterly reporting cycles
High match burden	Match > 30% of portfolio value	30% represents significant cost-sharing commitment
Cross-source overlap	2x size ratio between overlapping obligations	Filters trivial overlaps from meaningful interactions
Type-geographic overlap	Same type + same WRIA + time overlap	Identifies geographic concentration of similar work

Appendix D: Entity Composition

The benchmark dataset comprises 50 entities across 5 organizational types (see Section 3.4). Entity names are not published in this paper. Population-level findings are presented anonymously. Individual entity diagnostics are delivered only to the entity itself.

Freehold Advisory is a portfolio diagnostics practice focused on ecological restoration in Washington State. This paper presents diagnostic observations assembled from public data. It does not constitute financial, legal, or management advice.

Coding, data assembly, and presentation assisted by Claude AI.