Spatial Analysis of Vermont's Wildlife Corridor

Methodology, Data Sources, Key Findings, and Replication Guide

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1. Purpose

This document describes the methodology and data sources for two spatial analyses conducted in QGIS 3.44 using publicly available Vermont state datasets. It is written as a replication guide — anyone with QGIS and an internet connection can reproduce these findings using the same publicly available data. We welcome verification, scrutiny, and challenge. The analyses were conducted to answer two questions:

1. What share of Vermont's highest priority wildlife corridor is already enrolled in Current Use or permanently conserved?
2. What share of Vermont's total land area is enrolled in Current Use or permanently conserved under a corrected accounting?

Both analyses use only official public datasets maintained by the Vermont Center for Geographic Information (VCGI) and the Vermont Agency of Natural Resources (ANR). All data sources are publicly available and downloadable from the Vermont Open Geodata Portal.

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2. Data Sources

Dataset	Source / URL	Key Fields Used
VT Data — Vermont Highest Priority Connectivity Blocks (Vermont Conservation Design)	VCGI / Vermont Open Geodata Portalgeodata.vermont.gov	Block geometry; cons_pct (% permanently conserved within block)
VT Data — Current Use Program Properties (April 1, 2026)	VCGI / Vermont Open Geodata Portalgeodata.vermont.gov/datasets/VCGI::vt-data-current-use-program-properties/aboutPublished April 1, 2026 — first official public dataset joining enrollment data with statewide parcel geometry	FS_VCGI_OP (enrollment status flag); ACRESGL (listed acreage); SPAN (parcel identifier)
VT Data — Protected Lands (Vermont Protected Lands Database, VPLD)	VCGI / Vermont Open Geodata Portalgeodata.vermont.gov	POLYID (conserved parcel identifier); geometry
VT Data — Statewide Parcels (Grand List-Joined)	VCGI / Vermont Open Geodata Portalgeodata.vermont.gov	SPAN; PROPTYPE; ACRESGL; LAND_LV; RESCODE; TOWN; OWNER1

VT Data — State Boundary	VCGI / Vermont Open Geodata Portalgeodata.vermont.gov	State land area denominator
Vermont land area reference	VCGI — How to Reference Vermont's Land and Water Areavcgi.vermont.gov/resources/how-and-education-resources/how-reference-vermonts-land-and-water-area	Vermont land area: 5,899,041 acres (Census 2022 TIGER/Line, land only)

All layers were reprojected to NAD83 / Vermont (EPSG:32145), a projected coordinate system in meters, before any area calculations were performed.

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3. Corridor Analysis — Vermont's Highest Priority Connectivity Blocks

This analysis was conducted in March 2026. It examined what share of Vermont's 433 VCD Highest Priority Connectivity Blocks is already enrolled in Current Use or permanently conserved.

3.1 Methodology

3. Fix Geometries was applied to both the VCD Highest Priority Connectivity Blocks layer and the VCGI Protected Lands Database layer to resolve any invalid geometries before spatial operations.
4. Intersection: The enrolled parcel layer (Current Use Program Properties, filtered to FS_VCGI_OP IS NOT NULL, yielding 20,158 enrolled parcels) was intersected with the corridor blocks layer to identify enrolled parcels within the corridor.
5. Intersection: The VPLD layer was intersected with the corridor blocks layer to identify permanently conserved parcels within the corridor.
6. Union: The enrolled corridor layer and conserved corridor layer were merged using the Union operation to create a combined enrolled-or-conserved layer within the corridor.
7. Difference: The combined enrolled-or-conserved layer was subtracted from the corridor blocks layer using the Difference operation to produce the genuinely at-risk layer — corridor land that is neither enrolled nor permanently conserved.
8. Area calculation: $area * 0.000247105 was applied to each output layer to convert square meters to acres.
9. Parcel classification: A four-way attribute join classified all parcels intersecting the corridor as: (1) both enrolled and conserved, (2) enrolled only, (3) conserved only, or (4) neither — at-risk. This classification was used for ownership and tenure analysis. ACRESGL (grand list acreage) was used for this classification; see limitations in Section 5.

3.2 Key Findings — Corridor

Metric	Value
Total corridor area (433 VCD Highest Priority Connectivity Blocks)	2,837,622 acres
Enrolled in Current Use or permanently conserved (deduplicated)	2,072,617 acres (73.1%)

Genuinely at-risk (neither enrolled nor conserved)	765,005 acres (27.0%)
At-risk parcels — total count (parcel classification)	28,481 parcels
At-risk parcels below 25-acre Current Use minimum	25,773 parcels (90.5%)
At-risk parcels 25 acres or above (Current Use eligible)	2,708 parcels (9.5%)
At-risk acreage reachable at 10-acre corridor minimum	84.5% of at-risk acreage
At-risk acreage reachable at 5-acre corridor minimum	92.7% of at-risk acreage
Median enrollment date (enrolled corridor parcels)	2008 (nearly two decades ago)
Enrolled corridor acres managed 20+ years	>50%
Enrolled corridor acres managed 30+ years	>25%
Average land value — at-risk parcels (sub-25-acre resort corridors)	$12,664 per acre (Stowe: $95,398; Ludlow: $48,912)
Average land value — enrolled corridor parcels	~$2,500 per acre
Out-of-state ownership — high-value resort corridor parcels	45–87% depending on town

3.3 Note on cons_pct

The cons_pct field in the VCD Highest Priority Connectivity Blocks layer measures the percentage of each block that is permanently conserved. It was used in LURB's rulemaking as a proxy for protection status. Our analysis found that the statewide weighted average of cons_pct across all 433 highest priority blocks is approximately 36.8% — a figure that excludes all enrolled Current Use land. This compares to 73.1% when enrolled working lands are included. The 36-percentage-point gap between these figures represents the enrolled working landscape that the current regulatory framework cannot see.

Importantly, cons_pct was designed as a development threat metric — measuring how much of a block is permanently protected from development pressure — not as a measure of ecological function or conservation quality. VCD designated the Highest Priority Connectivity Blocks based on ecological quality and size within each biophysical region, not on cons_pct values.

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4. Statewide Analysis — Vermont's Conservation Baseline

This analysis was conducted in April 2026. It calculated the deduplicated statewide area of Vermont covered by enrolled Current Use parcels or permanently conserved parcels, expressed as a percentage of Vermont's total land area.

4.1 Methodology

10. Layer preparation: The full Vermont grand list parcel layer (344,317 features) was filtered to enrolled parcels only using the expression FS_VCGI_OP IS NOT NULL, yielding 20,158 enrolled parcels. Fix Geometries was applied to both this filtered layer and the Vermont Protected Lands Database.
11. Union: Vector > Geoprocessing Tools > Union was applied to the filtered enrolled parcel layer (20,158 parcels) and the VPLD layer. This merges the two polygon layers, preserving all geometry including overlapping areas.
12. Fix Geometries: Fix Geometries was applied to the Union output to resolve any invalid geometries produced at intersection boundaries.
13. Dissolve: Vector > Geoprocessing Tools > Dissolve was applied to the fixed Union output with no dissolve fields, merging all features into a single polygon representing all enrolled-or-conserved land in Vermont.
14. Area calculation: The dissolved layer's area was calculated using the Python Console: print([f.geometry().area() * 0.000247105 for f in iface.activeLayer().getFeatures()]). This produces the deduplicated statewide enrolled-or-conserved acreage by computing area directly from the dissolved geometry rather than summing attribute fields.

4.2 Key Findings — Statewide

Metric	Value
Enrolled in Current Use parcels (April 1, 2026)	20,158 parcels statewide
Enrolled + permanently conserved (deduplicated dissolved area)	3,615,600 acres
Vermont total land area (Census 2022 TIGER/Line, land only)	5,899,041 acres
Vermont enrolled or conserved as percentage of land area	61.3%
Additional acreage needed to reach 70% conservation mosaic	~513,000 acres
Additional acreage needed to reach 80% conservation mosaic by 2050	~1,100,000 acres

4.3 Why the Deduplicated Dissolve Matters

Simply summing enrolled acreage and conserved acreage would double-count parcels that are both enrolled in Current Use and covered by a conservation easement. The Union + Dissolve methodology eliminates this double-counting by merging all enrolled and conserved polygons into a single dissolved shape before measuring area. The resulting figure represents the true footprint of the enrolled-or-conserved landscape without overlap inflation.

Cross-check against official sources: The Vermont Department of Taxes confirms 2.57 million acres enrolled in Current Use as of 2024 (Vermont Legislature House Ways and Means Committee presentation, January 21, 2025). Our April 1, 2026 dataset shows 20,158 enrolled parcels — consistent with the Dept. of Taxes figure of "more than 19,000 parcels." The official VHCB/ANR Phase 1 Conservation Inventory (2024) shows 27% of Vermont permanently conserved under Act 59's definition, which excludes all enrolled working lands. Our 61.3% figure adds enrolled working lands to that baseline using a deduplicated spatial analysis. The two figures are not in conflict; they measure different things

under different definitions. Our 61.3% figure has not previously been calculated using parcel-level spatial data and is not contradicted by any existing public source.

Vermont's grand list parcel boundaries include water bodies, road rights-of-way, and other features within legal parcel boundaries. This means the enrolled parcel layer's geometry area is slightly larger than Vermont's official land-only area. The 61.3% figure reflects this: it measures the footprint of enrolled and conserved parcel boundaries as a share of Vermont's land area, which is the most accurate available measure of the enrolled-and-conserved landscape using parcel-level data.

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5. Known Limitations

- ACRESGL overcounting: The parcel attribute ACRESGL records the full grand list acreage of each parcel, not the portion clipped to the corridor boundary. Parcels that straddle the corridor boundary contribute their full listed acreage to parcel-level statistics, overstating at-risk acreage in the parcel classification. For this reason, aggregate acreage figures (73%, 765,005 acres, 61.3%) are derived from spatial geometry calculations, not ACRESGL sums. ACRESGL-based figures (acreage threshold analysis, ownership profiles) are used only for directional analysis and are noted as estimates.
- VCGI currency: The Vermont Protected Lands Database reflects protection status as of the most recent VCGI update. Recently acquired easements or fee parcels may not yet be represented, meaning the conserved acreage figure may be slightly understated.
- UVA layer currency: The April 1, 2026 Current Use Program Properties dataset reflects enrollment status as of April 1, 2026 (the Vermont tax year date). Parcels that enrolled or withdrew after April 1 are not reflected.
- Owner classification: Owner type categorization (individual/family vs. institutional vs. out-of-state) is based on keyword analysis of the OWNER1 field in the grand list. Family LLCs holding working farmland may be misclassified as institutional entities. The direction of error would understate individual/family ownership.
- Enrollment tenure: Tenure figures are based on the earliest ENTRYYEAR record for each SPAN in the UVA layer. Parcels that withdrew and re-enrolled would show the re-enrollment year rather than the original enrollment date, potentially understating long-term stewardship tenure for some parcels.
- Parcel boundary vs. land area: Vermont parcel boundaries include water bodies and road rights-of-way within legal boundaries. This causes enrolled and conserved parcel geometry to slightly exceed Vermont's official land-only area denominator (5,899,041 acres). The 61.3% figure reflects this boundary-inclusive measurement.

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6. Data Availability

All data sources used in these analyses are publicly available from the Vermont Open Geodata Portal (geodata.vermont.gov). Every step in Sections 3 and 4 can be replicated using these datasets. If your results differ from ours, we want to know. The following datasets can be downloaded directly:

- Current Use Program Properties: geodata.vermont.gov/datasets/VCGI::vt-data-current-use-program-properties/about

- Vermont Protected Lands Database: geodata.vermont.gov/datasets/VCGI::vt-data-protected-lands/about
- VCD Highest Priority Connectivity Blocks: geodata.vermont.gov/datasets/VCGI::vermont-highest-priority-connectivity-blocks/about
- Vermont Statewide Parcels: geodata.vermont.gov
- Vermont State Boundary: geodata.vermont.gov/datasets/VCGI::vt-data-state-boundary-1/about

Full QGIS project files, intermediate outputs, and the at-risk parcel CSV are available upon request. If you are attempting to replicate this analysis and run into questions about the methodology, we are glad to help. Contact: lucas@bigpicturefarm.com

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Analysis conducted March–April 2026 using QGIS 3.44. All data sources are publicly available ANR/VCGI datasets. countusinvt.org