



miistakis institute
APPLIED CONSERVATION RESEARCH

Value of Private Land Conservation in Alberta 3.0



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- Alberta Conservation Association (ACA)
- Crooked Creek Conservancy Society of Athabasca (CCCSA)
- Ducks Unlimited Canada (Alberta office) (DUC)
- Edmonton and Area Land Trust (EALT)
- Foothills Land Trust (FLT)
- Legacy Land Trust (LLT)
- Nature Conservancy of Canada (Alberta office) (NCC)
- Southern Alberta Land Trust Society (SALTS)
- Western Sky Land Trust (WSLT)

Executive Summary

Private land conservation (PLC) is an important strategy for conservation in Alberta. Over the past several years, the Miistakis Institute has worked with Alberta's private land conservation community to create a database of privately conserved lands, and identify and track metrics that illustrate the role of private land conservation.

Private land conservation has grown steadily from 1987 to present and as of spring 2024, 573,719 acres of land have been protected in Alberta – this was an increase of over 144,116 acres since our preliminary assessment was conducted in 2020.

The primary conservation purpose for the majority of properties is identified by land trusts as “ecological” whereas the secondary conservation purpose varies but is most commonly reported as recreation or agriculture. The most common ecological contribution identified by land trusts is wildlife habitat. Most land trusts also identify a primary working landscape purpose for their lands with agriculture (particularly grazing) being the most common use.

The number of acres of PLC varies across geographic regions in the province and that difference was illustrated using natural regions, natural subregions, Watershed Planning and Advisory Council (WPAC) areas and land-use framework regions. A notable difference in natural region and natural subregion assessments is that we removed human footprint and cropland from those assessments in this report. PLC occurred most often in Grassland and Parkland natural regions. At the natural subregion level, Foothills Fescue, followed by Montane, holds the highest number of PLC acres, and Montane, Foothills Fescue and Foothills Parkland have the highest percentage of land that is privately conserved. We identified that the Oldman Watershed Council's region contains the largest amount of PLC, followed by Red Deer River Watershed Alliance and the Bow River Basin Council. The South Saskatchewan land-use framework region holds the most privately conserved land, followed by the North Saskatchewan land-use framework region.

In Alberta, there are approximately 65,000,000 acres of private land making up approximately 40% of the total area in Alberta. Given the large proportion of land owned and managed privately, private land conservation offers an opportunity to maximize conservation benefits. In this report we illustrate and discuss these conservation benefits relative to three themes: biodiversity, watershed resiliency, and human well-being.

Private land conservation promotes biodiversity by protecting important habitat for various species:

- Over 370,000 acres of land with high value for biological intactness are conserved through PLC.
- Over 266,000 acres of PLC protect grasslands from development; grassland conservation through PLC has increased significantly over time representing a shift from 0.2% to 3.6% of private land between 2000 and 2020.
- Over 160,000 acres of PLC are within the winter range for elk, moose, deer and bighorn sheep, which supports these species during a challenging season. This represents 7.4% of private land in that range.
- Nearly 290,000 acres of PLC in watersheds with low to no at-risk native trout including Athabasca Rainbow Trout, Bull Trout, Westslope Cutthroat Trout and Arctic Grayling.

- 186,044 acres of PLC are located within a 5 km buffer of federal or provincial parks and protected areas. Protection in this buffer zone can increase connectivity for wildlife. Over 214,000 acres of high value ecological conservation land is also conserved through PLC.
- PLC also protects 115,636 acres of land that are within the areas identified as high risk for agricultural conversion.

Private land conservation supports watershed resiliency by protecting areas that contribute to maintaining desirable water quality and quantity:

- Between 0.5 and just over 1.3% of those watersheds identified as important for watershed resiliency (i.e., drought, flood, water quality) are conserved privately.
- The Oldman watershed has the highest number of acres and percent of land privately conserved compared with the Bow and Red Deer watersheds.
- Wetlands and riparian areas are important natural infrastructure for mitigating climate change effects. PLC conserves 30,571 and 98,184 acres of those environments within Alberta, respectively. Conservation of lands containing wetlands has increased steadily over time with 196.5 acres in 1990 increasing to 22,085 acres in 2020.
- 11.4% of private land located within the headwaters are conserved through PLC.

Private land conservation fosters human well-being by supporting sustainable recreational hunting activities, extending the benefits of parks protected areas, offering access to additional recreational opportunities for Albertans, and preserving scenic views:

- Over 160,000 acres of PLC are within the winter range for elk, moose, deer and bighorn sheep, which contributes to healthy populations and allows sustainable hunting opportunities. This represents 7.4% of private land in that range.
- 185,044 acres of land within a 5 km buffer of protected areas are preserved through PLC. This preserves open spaces and scenic views.
- Recreation is a secondary conservation purpose for 67% of reported privately conserved properties, many of which offer public access to hiking trails.
- PLC preserves 185,985 acres of land with high value scenic areas and has seen significant growth over time with 184 acres conserved by 1990, growing to 134,432 acres in 2020.
- PLC functions on working landscapes, allowing landowners to protect land from development, contribute meaningfully to conservation, while maintaining their working landscapes and livelihoods.

A [website](#) was developed to interactively view the contributions of private land conservation in Alberta.

Introduction

This report and its accompanying [website](#) were created to highlight the contributions by private land conservation (PLC) to conservation efforts in Alberta. A large-scale view of private land conservation, as is provided here and in two previous reports (Lee et al., 2021; Sinnatamby et al., 2023), allows land trusts, municipalities, and other levels of government to identify areas in need of general protections or protections targeted to specific ecosystem services (Ryan et al., 2014). Identifying priority lands before development or other land uses that permanently alter the landscape is key to conserving and protecting important ecosystem services, such as flood and drought mitigation (Duarte et al., 2024).

In 2021, the Miistakis Institute worked with the land trust community in Alberta to develop high-level metrics showcasing the impact of PLC in Alberta (Lee et al., 2021). Since then, the Miistakis Institute has expanded its network of partner organizations, developed a central database of privately conserved land, and broadened the scope of metrics used to monitor the contributions of private land conservation (Sinnatamby et al., 2023).

In Alberta, there are approximately 65,000,000 acres of private land (Government of Alberta, 2020), making up approximately 40% of the total area. Given the large proportion of land that is owned and managed privately, private land conservation offers an opportunity to maximize conservation benefits. In this report we illustrate and discuss these conservation benefits relative to three theme areas:

- Biodiversity
- Watershed resiliency
- Human well-being.

This project included the development of a [website](#) that provides an interactive view of private land conservation contributions in Alberta. Its objective is to establish measures that can be reassessed over time to highlight the ongoing role of the land trust community in conservation efforts across the province.

This technical report provides the methodology used to derive the metrics including the spatial data sources and serves as a companion piece for the results that are comprehensively displayed on the website.

Methodology

Land trust participants

The following nine organizations contributed to this project by sharing data and providing input and feedback on the metrics to evaluate and track the impacts of private land conservation in Alberta:

- Alberta Conservation Association (ACA)
- Crooked Creek Conservancy Society of Athabasca (CCCSA)
- Ducks Unlimited Canada - Alberta office (DUC)
- Edmonton and Area Land Trust (EALT)
- Foothills Land Trust (FLT)

- Legacy Land Trust (LLT)
- Nature Conservancy of Canada - Alberta office (NCC)
- Southern Alberta Land Trust Society (SALTS)
- Western Sky Land Trust (WSLT)

For the purposes of this report, ‘land trusts’, ‘land trusts in Alberta’, or “Alberta’s land trust community” refer collectively to these nine organizations.

Selecting metrics

To highlight the value of PLC in Alberta, we developed a suite of metrics to illustrate its role in maintaining biodiversity, enhancing watershed resiliency, and promoting human well-being. A preliminary list of metrics was identified during a workshop with land trust representatives and were prioritized using an online survey. Metrics were then selected based on rank, availability and quality of data; the resulting selection was included in Sinnatamby et al., (2023).

For the 2024 update, we administered two surveys – one to the land trust community and one to the government agencies that interact with private land conservation – that asked for feedback on the metrics used in the previous iteration. Incorporating feedback and our improved knowledge of available datasets, we refined the initial suite of metrics to be more streamlined, accessible to a broader audience, and inclusive of emerging priorities.

Description of metrics

Table 1 provides a short definition of each metric and indicates which theme(s) the metric relates to. Table 2 provides information on the spatial data source and any thresholds that were applied to the data before private land conservation areas were estimated.

Metrics presented in this report and on the website are displayed either as the number of acres of privately conserved land in Alberta or within a specific area of interest, or as a percentage related to the total amount of private land in the same area of interest. Please refer to the maps in the Appendix: Figure 40 to Figure 52 to view the spatial context for each metric.

Table 1. Metric name, definition and the theme(s) each metric relates to. Where no theme is indicated, the metrics are included in the “at a glance” section of the website and are intended to provide an overview.

Metric Name	Theme			Definition
	Biodiversity	Watershed Resiliency	Human Well-being	
Agricultural conversion risk	✓			Areas identified as at risk for conversion to agricultural land use as predicted by Olimb & Robinson’s probabilistic model.
Agriculture			✓	Privately conserved land that allows grazing, cultivation or haying as reported by each land trust.
Biodiversity intactness	✓			Alberta Biodiversity Monitoring Institute’s (ABMI) index comparing current to historic species presence as a reflection of current biodiversity. We used values ≥ 75 .
Ecological connectivity	✓			Areas identified as high value for ecological connectivity in Alberta, modelled by Marrec et al., (2020).

Metric Name	Theme			Definition
	Biodiversity	Watershed Resiliency	Human Well-being	
Elk/moose/deer/bighorn sheep winter range; Sustainable hunting	✓		✓	Area defined as ungulate winter range.
Environmentally significant areas	✓			Areas considered important to the long-term maintenance of biological diversity, physical landscape features or other natural processes based on four criteria: focal species, rare or unique focal habitat, ecological integrity, water quality and quantity.
Fish species	✓			Areas identified where adult populations of four at-risk native trout species are low, very low, or extirpated. Species include Arctic Grayling, Athabasca Rainbow Trout, Bull Trout and Westslope Cutthroat Trout.
Grasslands	✓			Managed and unmanaged grasslands identified using Agriculture and Agri-food Canada's Land Use Time Series dataset.
Headwaters		✓		Upstream HUC10 watersheds along the east slopes of the Canadian Rocky Mountains.
Hydrologically significant areas		✓		Areas with natural assets that provide beneficial hydrologic services calculated for Red Deer, Bow and Oldman watersheds only.
Land-use framework				Regions delineated for the land-use framework planning, which was based on watersheds and adjusted to align with municipal boundaries.
Natural regions				Land classifications based on natural or biogeographic features (geology, landform, soil, hydrology) including climate, vegetation and wildlife. Alberta has 6 natural regions.
Natural subregions				Land classifications based on natural or biogeographic features (geology, landform, soil, hydrology) including climate, vegetation and wildlife. Alberta has 21 natural regions.
Pathway to target 1: 30 x 30	✓			Private land conservation contributed to the Canadian Protected and Conserved Area Database.
Proximity to parks	✓		✓	Private land conservation located within a 5 km buffer from parks and protected areas; contribute to larger intact areas and improve connectivity.
Riparian areas	✓	✓		Lands adjacent to streams, rivers, wetlands and lakes.
Scenic views			✓	Visual values from the scenic resources assessment which reflects scenic quality and visual sensitivity.

Metric Name	Theme			Definition
	Biodiversity	Watershed Resiliency	Human Well-being	
Watershed Planning and Advisory Council		✓		Independent, non-profit organizations that are designated by the Alberta Government to act as stewards of Alberta's major watershed.
Wetlands	✓	✓		Areas within ABMI's wetland data set
Working landscapes			✓	Privately conserved land that is also used for agriculture, industry, or recreation.
WRRP: Drought, flood and water quality priority areas		✓		Watersheds identified by the GoA's Watershed Resiliency and Restoration Program (WRRP) as having a high priority (5) to maintain intact for drought resilience, flood resilience or maintaining water quality.

Value of private land conservation to Indigenous cultural or traditional significance scored highly and was included it in our preliminary data gathering steps. However, we felt that value to Indigenous culture was not a metric adequately represented with existing spatial data layers. We recommend an alternative approach be used to understand the relationship between private land conservation and Indigenous cultural values. Similarly, the species at risk metric received a high rank from land trusts and we included this metric in preliminary drafts of our results. But, following land trust feedback with concerns about data limitations, we removed this metric from this report and the website and recommend that this metric be reviewed using new data sources and analytical methods when available.

The climate change resiliency theme was omitted from the 2024 update of the report and website because feedback indicated the metrics within this theme were difficult to understand and not meaningful to viewers as a result.

Table 2. Data sources and notes on how data were selected or treated before PLC conservation area was estimated.

Name	Data Source Name	Data Selection Criteria	Data Source Information
Agricultural conversion risk	North America Great Plains Temporal Conversion Risk	Selected top two categories of risk.	Olimb & Robinson (2019). https://osf.io/jfega/
Agriculture	Alberta Private Land Conservation Database	Primary working landscape was grazing, haying or cultivation.	Primary working landscape field reported by land trusts in the private land conservation database maintained by the Miistakis Institute.
Biodiversity intactness	ABMI Species Intactness - All species	Selected areas with a value ≥ 75 .	ABMI, 2016, Species Intactness - All Species, https://www.abmi.ca/home/data-analytics/data-top/da-product-overview/GIS-Biodiversity-Data/Intactness.html
Elk/moose/deer/bighorn sheep winter range/sustainable hunting	Key Wildlife and Biodiversity Zones		Government of Alberta
Ecological connectivity		Selected areas with a Z-score > 1 .	Marrec et al., (2020)
Environmentally significant areas	GoA Environmentally Significant Areas	ESA_SUM > 0.189 - the classification level of ESAs	Government of Alberta, 2014, Environmentally Significant Areas, https://www.albertaparks.ca/albertaparksca/library/environmentally-significant-areas-report/
Fish species	GoA Fish Sustainability Index (HUC8 and HUC10) - Current Adult Density Metric	Low to functionally extirpated watersheds for Arctic Grayling, Athabasca Rainbow Trout, Bull Trout and Westslope Cutthroat Trout	Government of Alberta, 2014, Alberta Fish Sustainability Index, https://www.alberta.ca/fish-sustainability-index-overview.aspx
Grasslands	Agriculture and Agri-food Canada's (AAFC) Land Use Time Series (LUTS) dataset	Managed and unmanaged grasslands	https://open.canada.ca/data/dataset/fa84a70f-03ad-4946-b0f8-a3b481dd5248 Temporal plot used data from 2000, 2005, 2010, 2015, 2020; Plots representing data up to 2024 used 2020 AAFC LUTS data.
Headwaters	GoA Hydrologic Unit Code Watersheds of Alberta	HUC10 watersheds that intersect with the Rocky Mountain natural region	Government of Alberta
Hydrologically significant areas	NCC Hydrologically Significant Areas	Top 50% after organizing into 8 classes using geometric intervals. Data were only available for the Oldman,	Nature Conservancy Canada, 2018-2021, Hydrologically Significant Areas

Name	Data Source Name	Data Selection Criteria	Data Source Information
		Bow and Red Deer River watersheds.	
Natural regions	GoA Natural Subregions	Removed ABMI's 2021 human footprint and AAFC's 2020 LUTS crop classes.	Government of Alberta, 2006, Natural Regions and Subregions of Alberta, https://open.alberta.ca/opendata/gda-2f36921e-41e3-4cd8-813e-3333ea3c5983
Natural subregions	GoA Natural Subregions	Removed ABMI's 2021 human footprint and AAFC's 2020 LUTS crop classes.	Government of Alberta, 2006, Natural Regions and Subregions of Alberta, https://open.alberta.ca/opendata/gda-2f36921e-41e3-4cd8-813e-3333ea3c5983
Land-use framework	Land Use Framework Planning Regions		https://geodiscover.alberta.ca/geoportal/rest/metadata/item/60260b59b81d47b0bb805ca9d6b5131f/html
Pathway to target 1: 30 x 30	Canadian Protected and Conserved Areas Database (CPCAD)		Contribution to https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/protected-conserved-areas-database.html
Proximity to parks	GoA Parks and Protected Areas	This layer includes national parks. Parks and Protected Areas were buffered by 5 km.	Government of Alberta, 2022, Parks and Protected Areas of Alberta, https://open.alberta.ca/opendata/gda-6b96341f-2e19-4885-98af-66d12ed4f8dd
Riparian areas	GoA Lotic Riparian - Digital Elevation Model (DEM) Derived; Lotic Riparian - Strahler Order Derived	Two data sets were combined; data was expanded from the Bow, Oldman and Red Deer watersheds included in the 2023 report to the full province.	Government of Alberta, 2011, Lotic Riparian - Digital Elevation Model (DEM) Derived, https://open.alberta.ca/opendata/gda-14e2b4a7-aca7-4ba9-b9ed-fbe8b0ffe5b9 Government of Alberta, 2011, Lotic Riparian - Strahler Order Derived, https://open.alberta.ca/opendata/gda-557d68b0-6c82-4923-8ad8-a86d2e0fa49a
Scenic views	Scenic Resources Assessment - Visual Values	Top classes selected from visual values field: LAR, LPR, SSR = Class 5 UAR, UPR = Classes 8, 9 and 10.	Available by request from GoA; Resource was developed to support consideration of scenic resources within Alberta's Land-use Framework regional planning process. It as completed for all regions within Alberta except for Red Deer.
Wetlands	ABMI Wetlands Inventory		DeLancey ER, Simms JF, Mahdianpari M, Brisco B, Mahoney C, Kariyeva J. Comparing deep learning and shallow learning for large-scale wetland classification in Alberta, Canada. Remote Sensing. 2020 Jan;12(1):2. doi: https://doi.org/10.3390/rs12010002 . ABMI. 2021. "ABMI Wetland Inventory – Metadata." Edmonton, Alberta, Canada. https://abmi.ca/home/data-analytics/da-top/da-

Name	Data Source Name	Data Selection Criteria	Data Source Information
			product-overview/Advanced-Landcover-Prediction-and-Habitat-Assessment--ALPHA--Products/ABMI-Wetland-Inventory.html
Working Landscapes	Alberta private land conservation database		Primary working landscape field reported by land trusts in the private land conservation database maintained by the Miistakis Institute.
WRRP: Drought, flood and water quality priority areas	GoA WRRP Drought, Flood or Water quality Priority Areas	Highest priority areas - 5	Watershed Resiliency and Restoration Program, 2016, Priority Areas

Results: Value of Private Conservation

Private land conservation at a glance

Protective mechanisms – number of properties conserved

Private land conservation typically occurs using one of two main tools: conservation easements and fee simple ownership. In a fee simple arrangement, the land is purchased by the land trust or donated by the landowner, and the land is managed and owned by the land trust.

Through conservation easements, on the other hand, ownership remains with the landowner but a voluntary, legal agreement between the landowner and the land trust puts mutually agreed upon restrictions on some activities on the land.

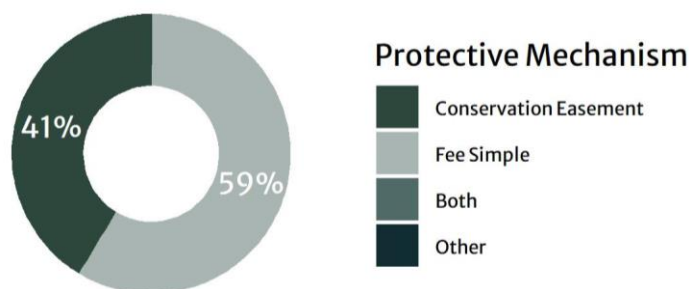


Figure 1. Percent of privately conserved land based on number of properties conserved through conservation easements or fee simple ownership. Both and other accounted for less than 1%.

Protective mechanisms – acres conserved

Based on information provided by the land trusts, we identified that, in Alberta, most properties that are conserved privately are conserved through fee simple ownership (Figure 1), whereas when evaluated on a per-acre basis, conservation easements are the more popular tool (Figure 2).

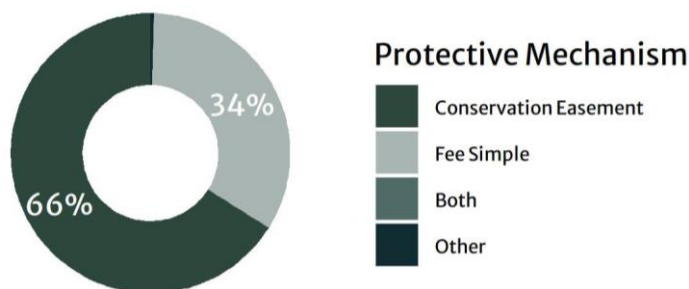


Figure 2. Percent of privately conserved land based on acres conserved through conservation easements or fee simple ownership. Both and other accounted for less than 1%.

Land Conservation Programs

Two key land conservation programs that support private land conservation in Alberta are Environment and Climate Change Canada's (ECCC) Ecological Gifts Program and the Government of Alberta's (GoA) Alberta Land Trust Grant Program.

The Ecological Gifts Program offers significant tax benefits to landowners who donate ecologically sensitive land. The program began in 1995 and by March 31, 2024, had received 1886 ecological gifts donated equaling over 600,000 acres valued at over 1 billion dollars (Environment and Climate Change Canada, n.d.).

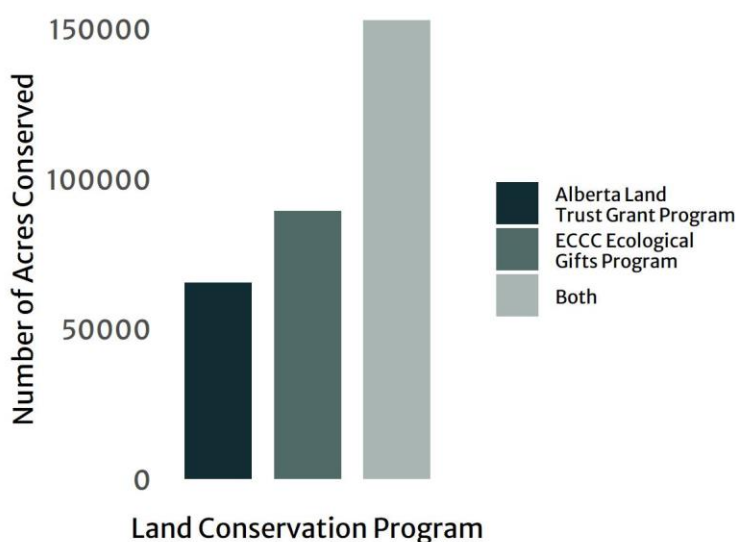


Figure 3. Number of acres of private land conservation funded through only the Alberta Land Trust Program, only ECCC's Ecological Gifts Program or both.

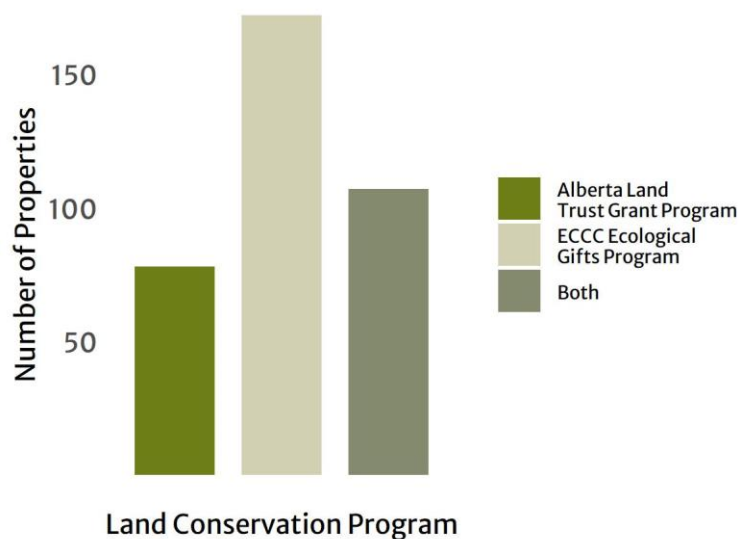


Figure 4. Number of properties funded through only the Alberta Land Trust Grant Program, only ECCC's Ecological Gifts Program or both.

The Alberta Land Trust Grant Program was established in 2011 and provides funding directly to land trusts to establish conservation easements or to administer or steward conservation easements or fee simple properties.

According to information provided by the land trusts, as of spring 2024, the Alberta Land Trust Grant Program had supported 185 properties and 218,085 acres of private land conservation, and the Ecological Gifts Program had supported 276 properties and 240,583 acres. Just over 152,722 acres of land within 107 properties were funded by both programs (Figure 3, Figure 4).

Conservation purposes

While most privately conserved land is primarily conserved for ecological purposes, the secondary conservation purpose varied (Figure 5). Land trusts identified recreation as the secondary conservation purpose for most properties followed by agriculture.

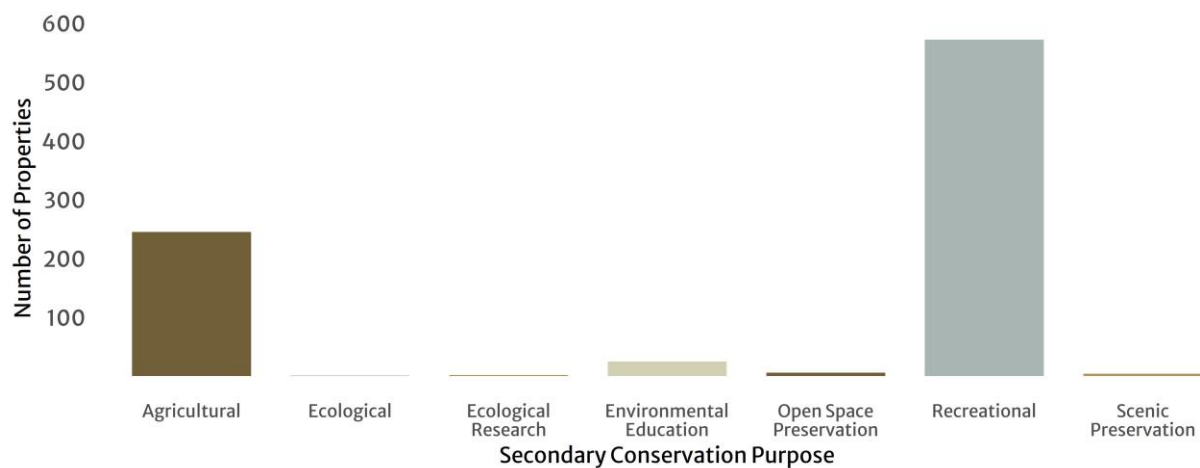


Figure 5. Land trust-reported secondary conservation purposes for their privately conserved properties.

Ecological Contribution

Land trusts also identified the primary ecological contribution provided by each property. Of these, “Important patches of terrestrial or aquatic wildlife habitat”, called wildlife habitat in Figure 6 was the most popular response, followed by “Important areas of natural vegetation”, called natural vegetation, and ecological connectivity.

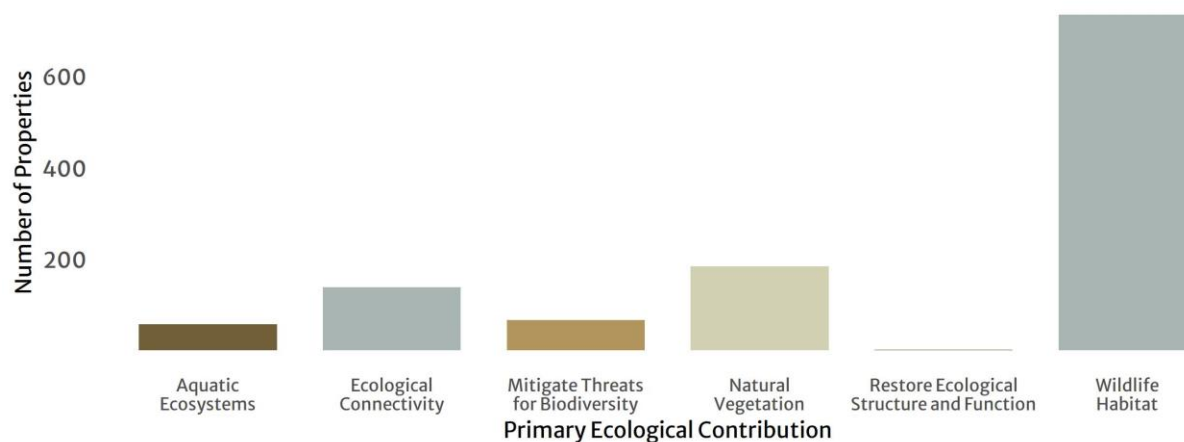


Figure 6. Primary ecological contributions identified by land trusts for their privately conserved properties.

Working landscapes

Private land conservation allows landowners to maintain working landscapes while protecting land from development and contributing to ecological outcomes. Of the 965 properties that identified a working landscape purpose, grazing was the most common activity with recreation as a close second.

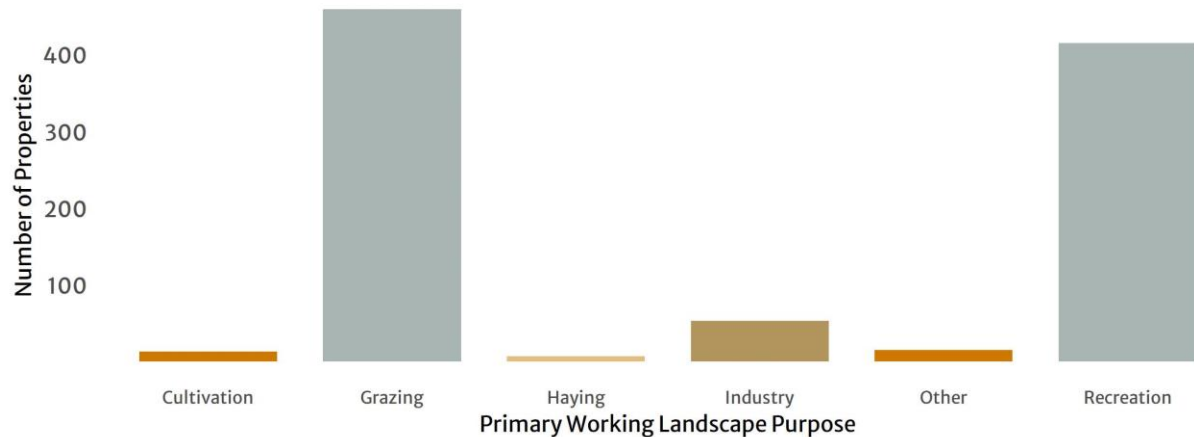


Figure 7. Primary working landscape purpose identified by land trusts for their privately conserved land.

Conservation over time

Private land conservation has grown steadily in Alberta since 1987 (Figure 8) with some years reflecting notably higher growth in conservation (Figure 9). Since 2020, when a preliminary assessment was conducted by the Miistakis Institute, an additional 144,119 acres have been conserved through private land conservation (Lee et al., 2021).

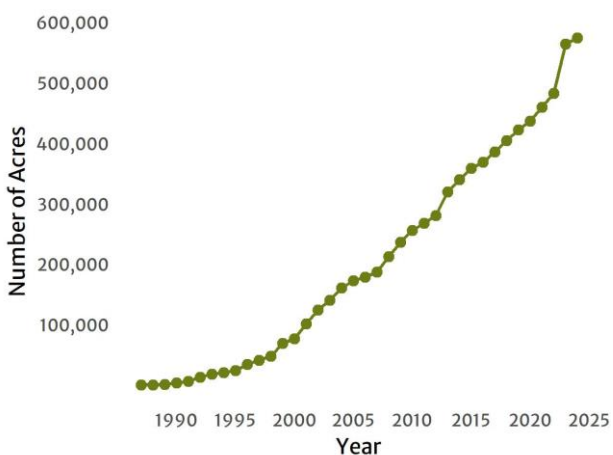


Figure 8. Cumulative acres of privately conserved land in Alberta between 1987 and 2024.

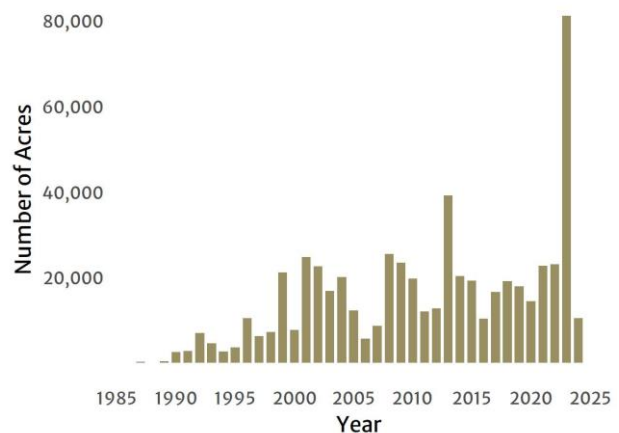


Figure 9. Number of new acres of privately conserved land in Alberta presented from 1987 to 2024.

Conservation over space

Natural region

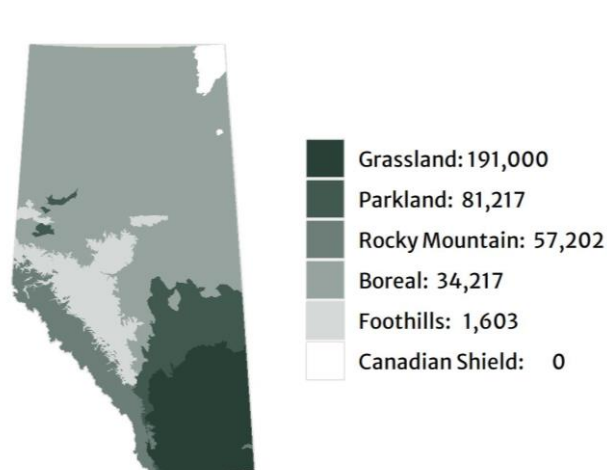


Figure 10. Number of acres protected by private land conservation presented by natural region. Human footprint and crop were removed from the area considered.

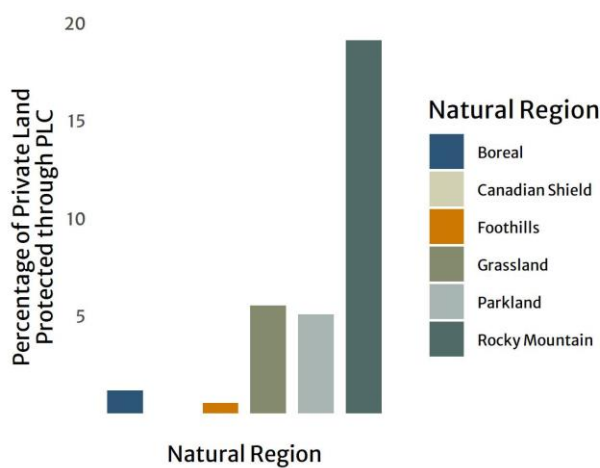


Figure 11. Percentage of private land that is protected by PLC in each natural region. Human footprint and crop were removed from the area considered.

The number of acres of privately conserved land varies throughout the province with the highest number of acres located in the Grasslands natural region, followed by Parkland and Rocky Mountain regions (Figure 10, Figure 11, Figure 12, Table 3). A notable change to our methods from Sinnatamby et al., (2023) is the removal of the ABMI's 2021 human footprint and Agriculture and Agri-food Canada's 2020 Land Use Time Series crop classes from the private land available within each natural region. This adjustment better represents the percentage of available private land that is conserved through PLC. The highest percentage of available private land was conserved in the Rocky Mountain natural region, followed by Grasslands and Parkland natural regions, but the most remaining available private land is present in the Grasslands natural region (Figure 12).

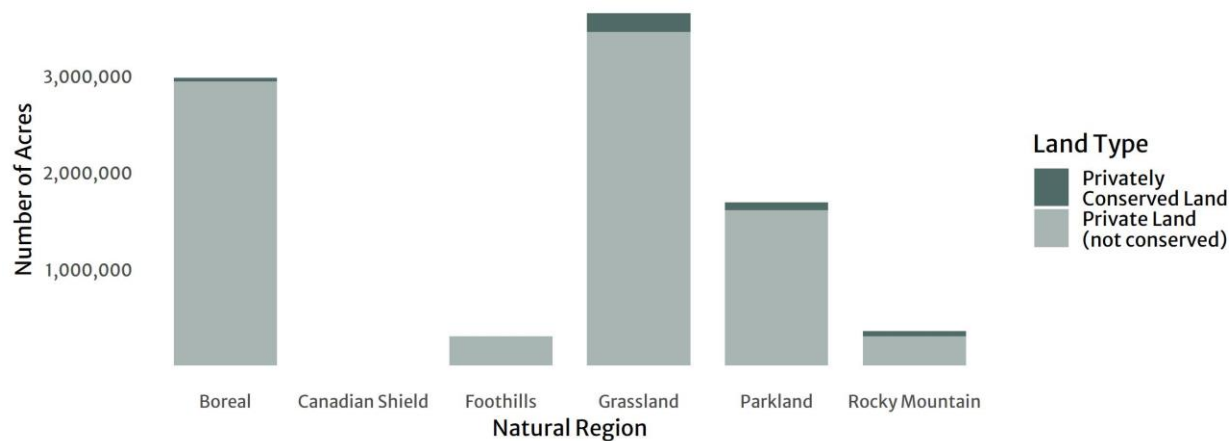


Figure 12. Number of acres of private land and privately conserved land by natural region. Human footprint and crop were removed from the area considered.

Table 3. Acres of private land conserved private land by natural region, along with the percentage of private land conserved through PLC. Canadian shield is not shown because it is entirely Crown land. Human footprint and crop were removed from the area considered.

Natural Regions	Private Land Conservation		Private Land (Total)
	Acres	Percent of private land	Acres
Boreal	34,217	1.16	2,941,249
Foothills	1,603	0.54	299,563
Grassland	191,000	5.53	3,453,789
Parkland	81,217	5.06	1,604,585
Rocky Mountain	57,202	19.08	299,750

Natural subregion

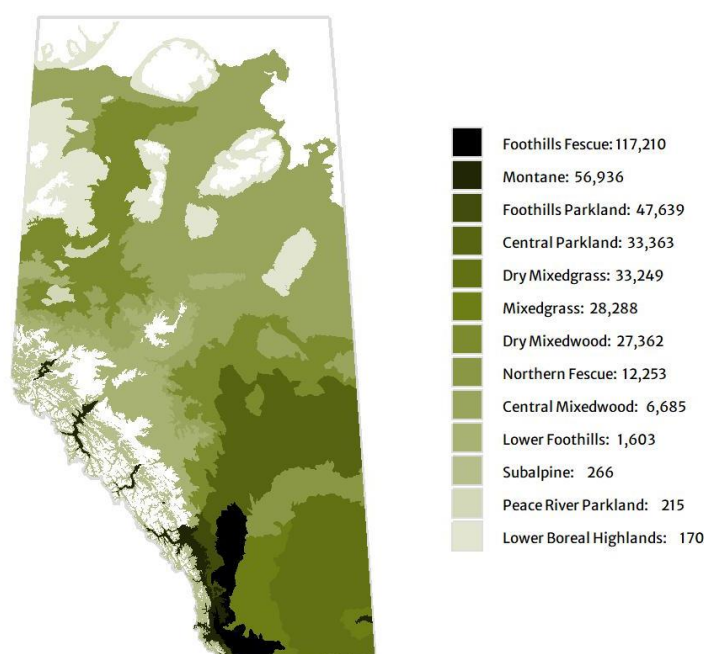


Figure 13. Number of acres protected by private land conservation presented by natural subregion. Eight natural subregions where PLC is not present are not listed in the legend. Human footprint and crop were removed from the area considered.

unprotected remaining private land.

Figure 13, Figure 15, Figure 14 and Table 4 present similar information as the natural region assessment above, but on a finer scale using natural subregions. Once again, we removed ABMI's 2021 human footprint and AAFC's 2020 LUTS crop classes from this assessment in this report which differs from Sinnatamby et al., (2023) where no footprints were removed.

Foothills Fescue (within the grassland natural region), Montane (within the Rocky Mountain natural area), and Central Parkland and Foothills Parkland (within the Parkland natural region) contain the most privately conserved acres.

The highest percentages of remaining private land protected through private conservation were in the Montane, Foothills Parkland, and Foothills Fescue subregions. But Dry Mixedwood, Dry Mixedgrass and Central Parkland contain the most

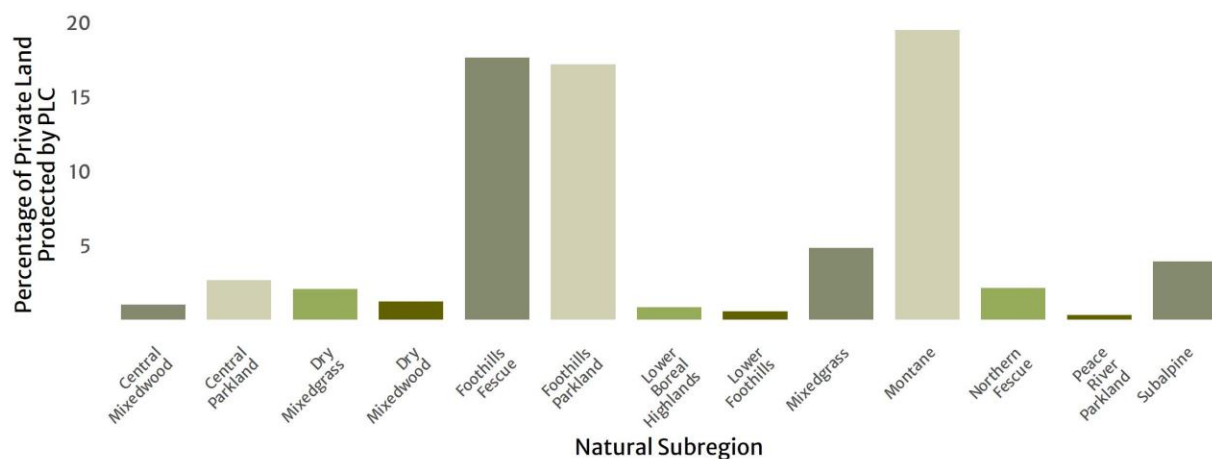


Figure 14. Percentage of private land in natural subregions that is protected by PLC. Natural subregions with no PLC are not shown. Human footprint and crop were removed from the area considered.

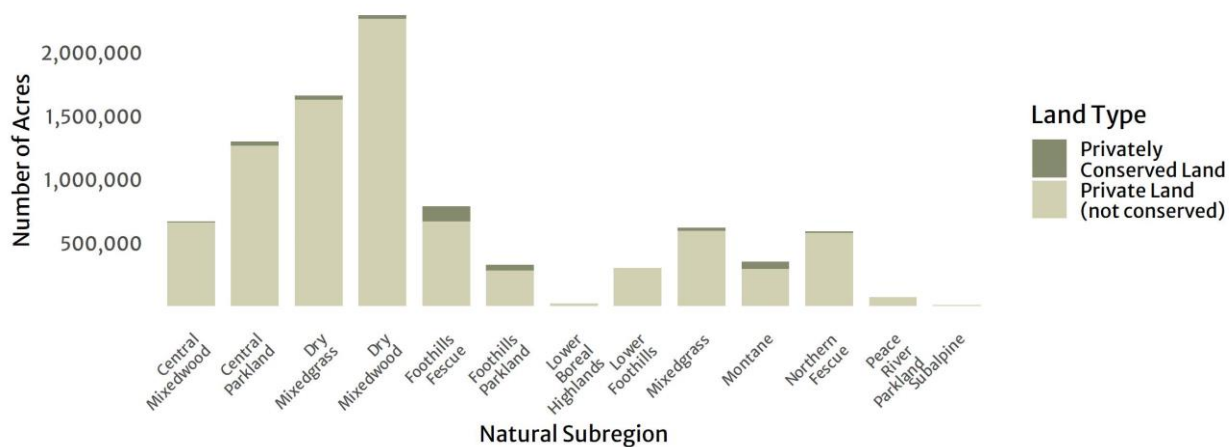


Figure 15. Number of acres of private land and privately conserved land by natural subregion. Natural subregions with no PLC are not shown. Human footprint and crop were removed from the area considered.

Table 4. Number of acres of private land (total and privately conserved) by natural subregions and the percentage of private land that is conserved through PLC. Human footprint and crop were removed from the area considered. Only natural subregions with private land conservation are shown.

Natural Subregion	Private Land Conservation		Private Land (Total)
	Acres	Percent of private land	Acres
Central Mixedwood	6,685	1.02	657,998
Central Parkland	33,363	2.65	1,259,718
Dry Mixedgrass	33,249	2.05	1,622,500
Dry Mixedwood	27,362	1.21	2,262,192
Foothills Fescue	117,210	17.58	666,740
Foothills Parkland	47,639	17.15	277,802
Lower Boreal Highlands	170	0.81	20,894
Lower Foothills	1,603	0.54	298,327
Mixedgrass	28,288	4.80	589,184
Montane	56,936	19.44	292,889
Northern Fescue	12,253	2.13	575,365
Peace River Parkland	215	0.32	67,065
Subalpine	266	3.91	6,805

Watershed planning and advisory council

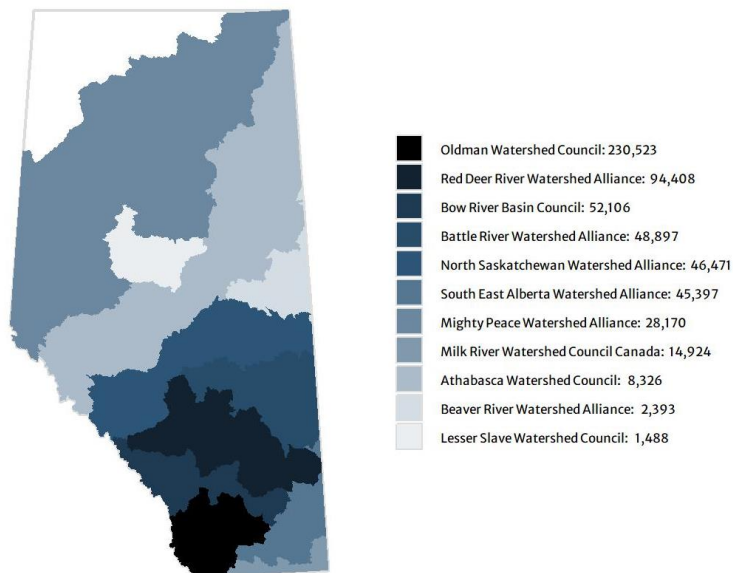


Figure 16. Number of acres of privately conserved land presented by Watershed Planning and Advisory Council (WPAC)

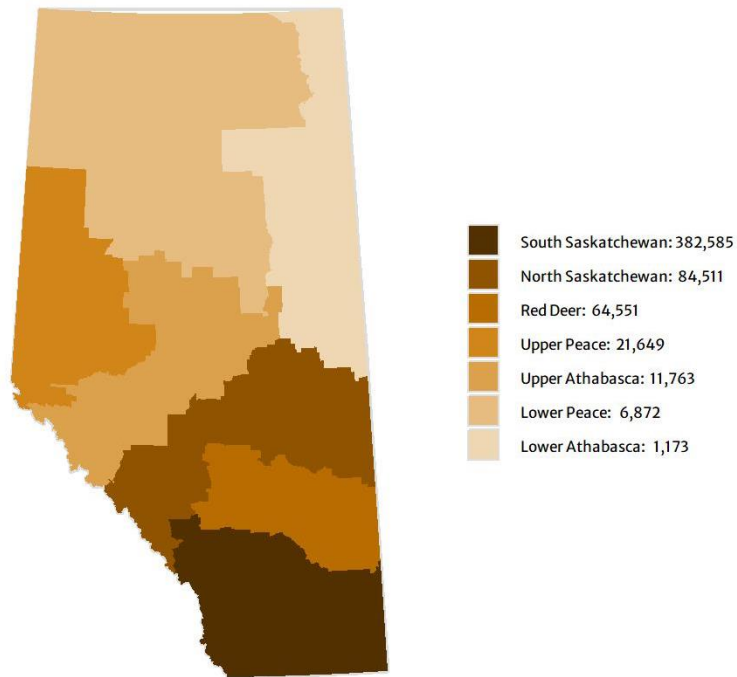
Private land conservation acres were also assessed by the Watershed Planning and Advisory Council (WPAC) areas of responsibility (Figure 16). WPACs are independent non-profit organizations that are designated by the Government of Alberta to act as stewards of Alberta's major watersheds.

The highest number of privately conserved acres occurred in the Oldman Watershed Council's region, followed by the Red Deer River Watershed Alliance, and the Bow River Basin Council. Oldman Watershed Council also had the highest percentage of its area conserved privately (Table 5).

Table 5. Number of acres of privately conserved land and its representation as a percent of total area (Crown and private) in the watershed.

Watershed Planning and Advisory Council	Private Land Conservation	
	Acres	Percent
Athabasca Watershed Council	8,326	0.03
Battle River Watershed Alliance	48,897	0.55
Beaver River Watershed Alliance	2,393	0.05
Bow River Basin Council	52,106	0.82
Lesser Slave Watershed Council	1,488	0.03
Mighty Peace Watershed Alliance	28,170	0.05
Milk River Watershed Council Canada	14,924	0.88
North Saskatchewan Watershed Alliance	46,471	0.33
Oldman Watershed Council	230,523	3.52
Red Deer River Watershed Alliance	94,408	0.76
South East Alberta Watershed Alliance	45,397	0.93

Land-use framework



Land-use framework planning regions were developed as part of the land-use planning initiative that began in 2008 to provide blueprints for land-use management and decision-making in Alberta. Seven regions were delineated to roughly follow large watersheds but altered to follow municipal boundaries.

South Saskatchewan Region contains the largest number of acres of privately conserved land, which also represents the largest percentage of the region (Figure 17, Table 6).

Figure 17. Number of acres of private land conservation illustrated by Land-use Framework planning region.

Table 6. Number of acres of privately conserved land and its representation as a percent of total area (Crown and private) in the land use framework region.

Land Use Framework Region	Private Land Conservation	
	Acres	Percent
Lower Athabasca Region	1,173	0.01
Lower Peace Region	6,872	0.01
North Saskatchewan Region	84,511	0.4
Red Deer Region	64,551	0.52
South Saskatchewan Region	382,585	1.85
Upper Athabasca Region	11,763	0.06
Upper Peace Region	21,649	0.12

Rationale for themes

For this 2024 update, we focused on three theme areas: biodiversity, watershed resiliency and human well-being.

Biodiversity is declining worldwide at an alarming rate. In response, the Convention on Biological Diversity developed targets of land and water that must be protected by specific dates. The initial goal was to conserve 17% of terrestrial and inland water areas by 2020, followed by an updated target of 25% by 2025 and 30% by 2030. Private land conservation has been recognized as a necessary tool to help reach this goal (Chapman et al., 2023). In some areas in Alberta, most land is privately owned (Lee et al., 2021), and as such, private land conservation may offer the only viable tool to protect biodiversity and other ecosystem services in those regions.

Watershed health is under constant pressure from human land uses. Alberta faces many challenges around water quantity and balancing this with growing demand for this resource. While Alberta is fortunate to have clean water resources, it is essential to protect this resource.

In rapidly developing landscapes with increasing demands to meet numerous societal needs, opportunities for enjoying nature and doing so in a sustainable way can become a challenge. Particularly in and near urban environments, it can be a challenge to maintain those natural spaces.

Of course, there are many interconnections between these themes where some metrics relate to more than one theme, but also where benefits to one theme have implications for one or more of the other themes. For example, healthy watersheds are more likely to provide the habitat necessary to support increased biodiversity, which in turn is expected to have an impact on human well-being (Isbell et al., 2023).

Biodiversity Metrics

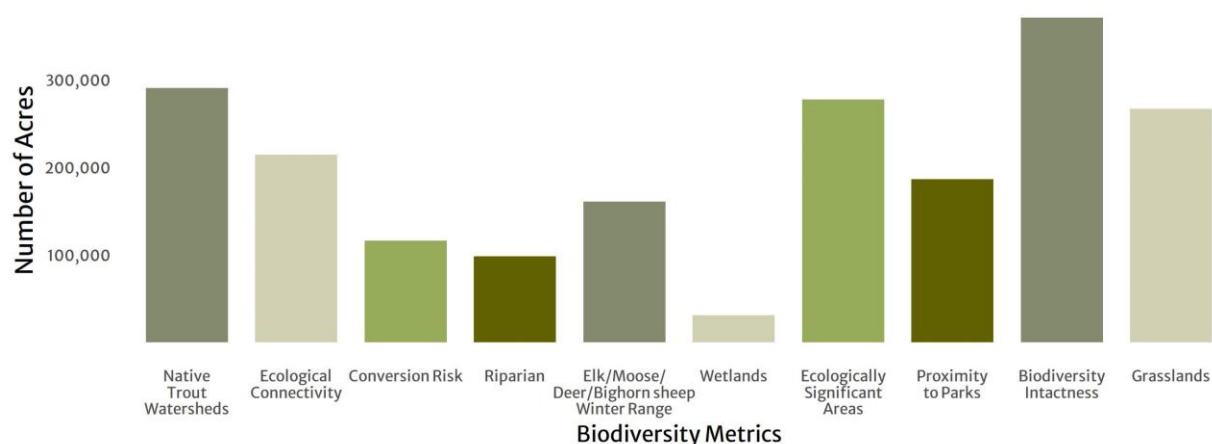


Figure 18. Acres of private land conservation for all metrics under the biodiversity theme presented on the same scale to improve comparability.

Table 7. Acres and percent of private land conservation and acres of total private land for the biodiversity theme.

Metric Name	Private Land Conservation		Private Land (Total)
	Acres	Percent of private land	Acres
Agricultural conversion risk	115,636	2.21	5,233,534
Biodiversity intactness	370,058	5.06	7,308,654
Ecological connectivity	214,072	7.29	2,936,357
Elk, moose, deer, bighorn sheep winter range	160,540	7.41	2,167,873
Environmentally significant areas	276,752	6.28	4,406,191
Fish: at-risk native trout			
All species	289,975	1.91	15,153,517
Arctic Grayling	88,881	0.83	10,702,703
Athabasca Rainbow Trout	934	0.20	460,548
Bull Trout	218,958	3.73	5,875,372
Westslope Cutthroat Trout	225,489	6.96	3,239,529
Grasslands	266,166	5.39	4,937,764
Pathway to target 1: 30 x 30	55,996		
Proximity to parks	186,044	3.35	5,555,354
Riparian	98,184	1.40	7,030,129
Wetlands	30,571		

Ecological connectivity

In a landscape increasingly fragmented by human development, preserving undeveloped lands is essential for ecological connectivity. Habitat fragmentation isolates wildlife populations, limiting migration, reducing genetic diversity, and increasing extinction risk. Connected landscapes support species dispersal, enabling adaptation to climate change while maintaining vital ecosystem functions like pollination and predator-prey dynamics.

Ecological corridors also enhance climate resilience, helping landscapes absorb disturbances like wildfires and floods. To evaluate the contribution of PLC to preserving ecological connectivity, we used a large-scale species-agnostic landscape connectivity model developed by Marrec et al., (2020) for Alberta. Using their model output, we calculated a z-score (by subtracting the mean from each pixel score and dividing by the standard deviation) and used a z-score cut-off of 1 where all values greater than one were considered important ecological flow routes (Marrec et al., 2020). We then calculated the number of acres of private land and privately conserved land within those important ecological connectivity habitats and calculated the percentage of the total private land that is currently preserved by PLC (Figure 19).



Figure 19. Percentage of private land within high value ecological connectivity land that is protected by PLC.

Grasslands

Grasslands are among the most threatened ecosystems in the world. Their loss has negative implications for climate change since they contribute to carbon storage, and biodiversity and connectivity since they provide vital habitat for wildlife to use and move throughout the landscape. To assess the role of PLC in protecting grasslands, we selected managed and unmanaged fields in Agriculture and Agri-food Canada's (AAFC) Land Use Time Series (LUTS) dataset. This dataset is produced every 5 years so the current snapshot of the percentage of private land protected by PLC used the 2020 LUTS data (Figure 20). Percentages for the temporal assessment were calculated using LUTS data from the corresponding year (e.g., 2000 LUTS data was compared to 2000 PLC cumulative totals).

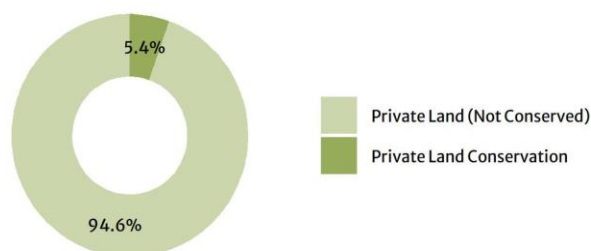


Figure 20. Percentage of grasslands on private land protected through PLC. Grasslands were defined as those within managed and unmanaged grasslands in Agriculture and Agri-food Canada's Land Use Time Series.

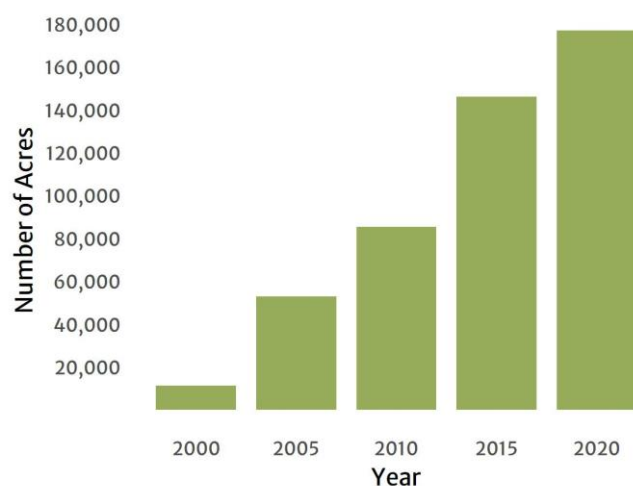


Figure 21. Number of acres within managed and unmanaged grasslands in AAFC's LUTS dataset that was protected by PLC over time between 2000 and 2020.

From 2000 to 2020, PLC protection of grasslands increased from 11,287 to 176,713 acres, representing a shift from 0.2% to 3.6% of total private land (Figure 21). As of 2024, PLC now protects 266,165 acres of managed and unmanaged grasslands on private land representing 5.4% of grasslands (relative to 2020 private land totals).

Agricultural conversion risk

One significant threat to grasslands is the risk of conversion for agricultural use, particularly conversion to cropland. To demonstrate how much land is protected against this risk by PLC, we used a model developed by Olimb and Robinson (2019) that predicted areas vulnerable to conversion. We calculated the amount of privately conserved land that overlaps land classified in the two highest conversion risk categories. Private land conservation currently preserves 115,636 acres from conversion representing 2.2% of private land in those high-risk areas (Figure 22, Table 7).

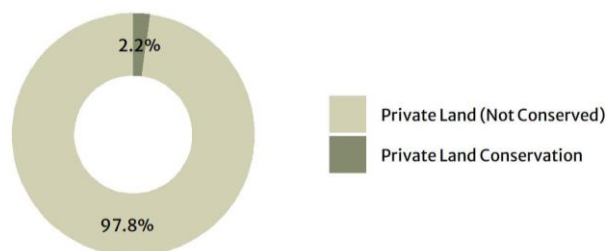


Figure 22. Percentage of private land within Olimb & Robinson's (2019) modelled conversion risk area that is protected by PLC.

Fish population health

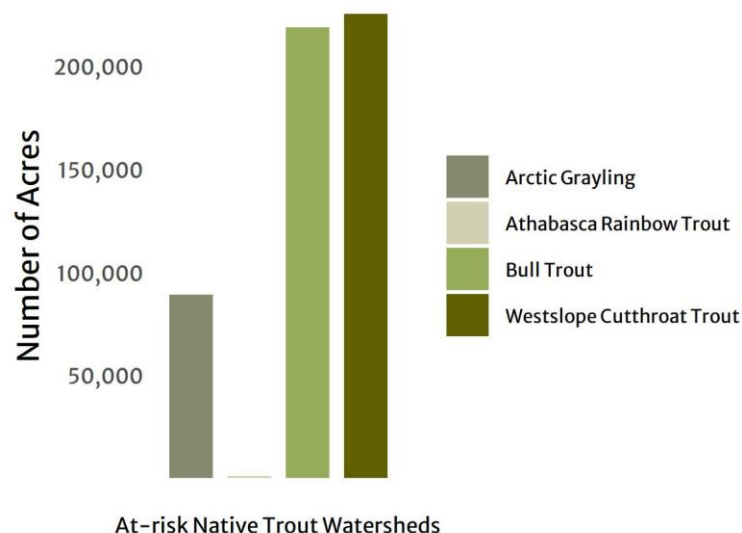


Figure 23. Number of acres of private land conservation in watersheds where at-risk native trout are low to extirpated.



Figure 24. Percentage of private land in watersheds where at-risk native trout are low to extirpated that is conserved through PLC.

Alberta is home to three native trout species that are federally listed Species at Risk, as well as Arctic grayling, a trout relative listed as a species at risk in Alberta (Cahill & Walker, 2015; Sinnatamby et al., 2020). Measures to address habitat loss and degradation, including habitat fragmentation, are identified as recovery strategies for these species (Fisheries and Oceans Canada, 2019, 2020b, 2020a)

Figure 23 shows the number of privately conserved acres within watersheds where these populations are low in density or extirpated where they previously existed according to the GoA's Fish Sustainability Index (MacPherson et al., 2014).

Privately conserved land offers a tool to alleviate some of the land-use stressors in these watersheds. Our results indicate that the number of privately conserved acres within these key watersheds for the endangered Athabasca Rainbow Trout is low (Table 7). Combined, PLC provides protection for almost 2% of private land within those watersheds with low densities or extirpated populations.

Elk, moose, deer and bighorn sheep population health

Winter is a particularly challenging season for elk, moose, deer and bighorn sheep survival (Kautz et al., 2020).

Private land conservation contributes to biodiversity in this group of species by protecting land in their winter range, improving connectivity, and reducing stress on these species.

PLC protects nearly 160,540 acres of this habitat and 7.4% of total private land in the winter range area (Figure 25, Table 7).

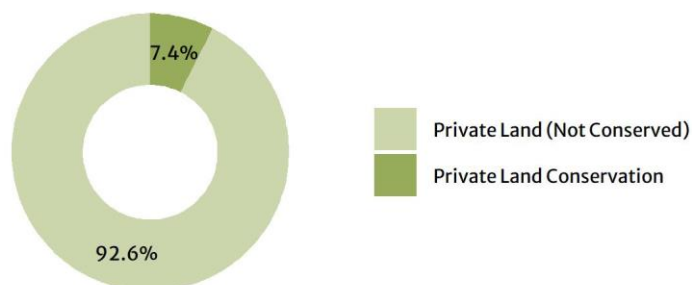
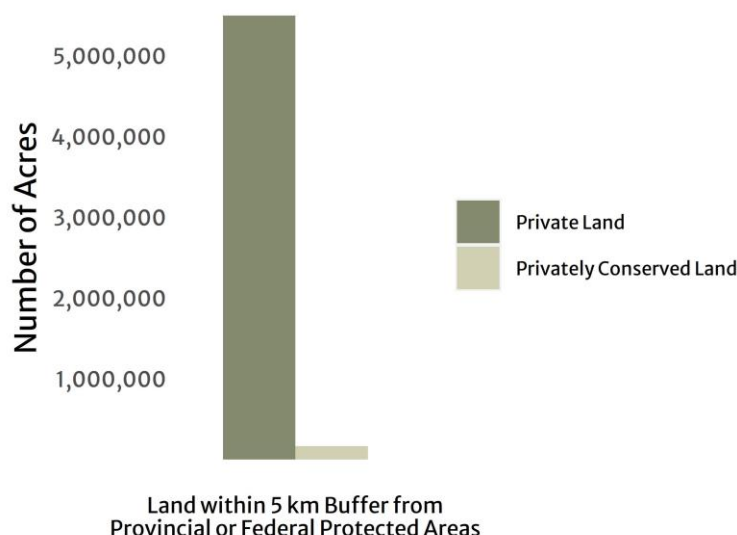


Figure 25. Percent of land within ungulate winter range that is private land (not conserved) and privately conserved land.

Proximity to parks



Private land conservation located near other protected areas can enhance biodiversity by extending the ecological benefits of parks and protected areas, improving connectivity with known wildlife habitats, and creating a buffer between those protected public spaces and other land uses.

Private land conservation in Alberta located within a 5 km buffer of other protected spaces protects 186,044 acres, representing 3.5% of the existing private land (Figure 26).

Figure 26. Number of acres of land within a 5 km buffer around parks and protected areas that is private (protected and unprotected) and privately conserved.

Biodiversity intactness

Biodiversity intactness is an index that was developed and calculated by ABMI (2015). This index compares current biodiversity to historical where deviations (positive or negative) from historical estimates result in a lower score. We recorded 370,058 acres of privately conserved land, representing 2.2% of total private land within the top 25% of this index (Table 7, Figure 18).

Environmentally significant areas

Environmentally significant areas are important to the long-term maintenance of biological diversity, physical landscape features or other natural processes based on four criteria: focal species, rare or unique focal habitat, ecological integrity, water quality and quantity (Fiera Biological Consulting Ltd.,

2014). We identified 276,752 acres of privately conserved land within these environmentally significant areas in Alberta (Table 7, Figure 18).

Wetlands and riparian areas

Wetlands host a disproportionate amount of biodiversity relative to their size (Dudgeon et al., 2006; Kingsford et al., 2016) including microbes, plants, terrestrial, aquatic and amphibious species. Similarly, riparian environments are hosts to unique plant species that have remarkable adaptations to living in areas that fluctuate dramatically with respect to water level. Likely because of the variable nature of these environments, they tend to be hotspots for biodiversity by offering a variety of habitat characteristics that can meet the requirements of different species variably throughout their life cycle. Our assessment of private land conservation relating to wetlands found that 30,571 acres of wetlands are protected Alberta-wide (Figure 18, Table 7).

Pathway to Target 1: 30 x 30

Pathway to Target 1 is Canada's approach to contribute to the United Nations Convention on Biological Diversity's Aichi Target 11, which aims to meet an international biodiversity conservation commitment. The initial target was to preserve 17% of Canada's land and waters by 2020 and was later updated to protect 30% by 2030. In 2024, we contributed records of 90 properties (representing 55,996 acres) of privately conserved land on behalf of their managing land trusts to the Canadian Protected and Conserved Areas Database (CPCAD). This database contains spatial and attribute data on protected areas and other effective area-based conservation measures (OECMs) in Canada and is counted towards the 30 x 30 target (Table 7).

Watershed Resiliency

Watershed resiliency metrics

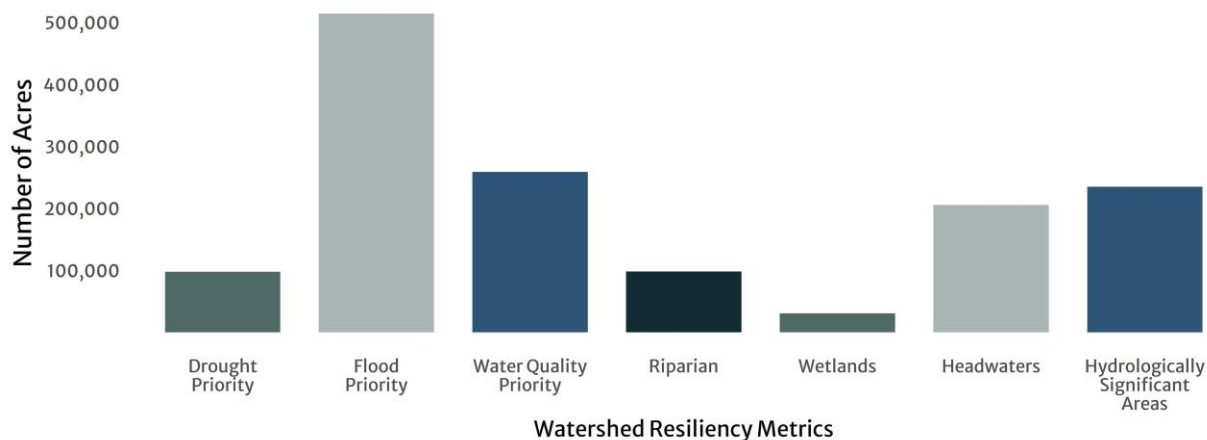


Figure 27. Acres of private land conservation for all metrics under the watershed resiliency theme presented on the same scale to improve comparability.

Table 8. Acres and percent of private land conservation, and acres of total private land for the watershed resiliency theme.

Metric Name	Private Land Conservation		Private Land (Total)
	Acres	Percent	Acres
Headwaters	205,334	11.45	1,793,971
Hydrologically significant areas – Bow, Oldman and Red Deer watersheds combined	234,704	4.73	4,966,614
Riparian	98,184	1.40	7,030,129
Watershed Resiliency and Restoration Metrics			
Drought	97,694	1.30	5,704,558
Flood	513,957	0.50	74,924,589
Water quality	258,506	0.93	20,780,517
Wetlands	30,571		

Headwaters

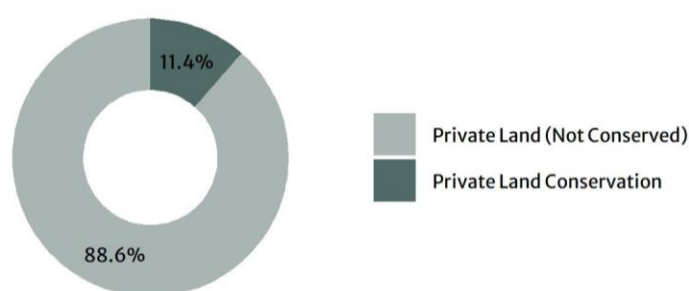


Figure 28. Percentage of private land conserved within the headwaters in Alberta. Headwaters was defined as HUC10 watersheds within the Rocky Mountain natural region.

Preserving headwater stream integrity is important for maintaining downstream ecological health and ecosystem services such as water quality and water supply (Alexander et al., 2007; Colvin et al., 2019). We quantified the amount of private land conservation occurring in headwater watershed where we defined headwaters in Alberta as HUC10 watersheds that intersect with the Rocky Mountain natural region.

Private land conservation protects 205,334 acres within the headwater region, accounting for 11.4% of private land in that area (Figure 29, Table 8).

Riparian

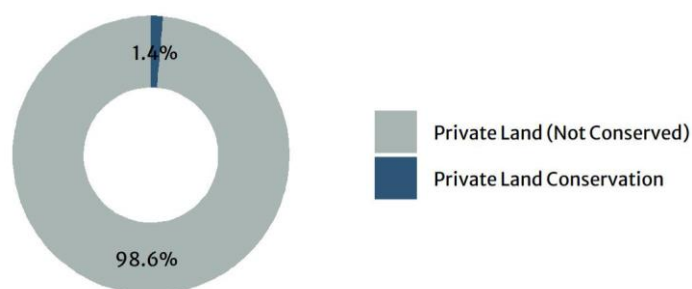


Figure 29. Percentage of riparian areas on private land throughout the province that are protected through PLC.

Riparian areas are known to play an important role in maintaining water quality by trapping sediment, stabilizing banks and reducing erosion.

Throughout Alberta PLC protects 98,184 acres of riparian lands, accounting for 1.4% of private lands in riparian areas in the province (Figure 29, Table 8).

Watershed Resiliency and Restoration Program priority areas

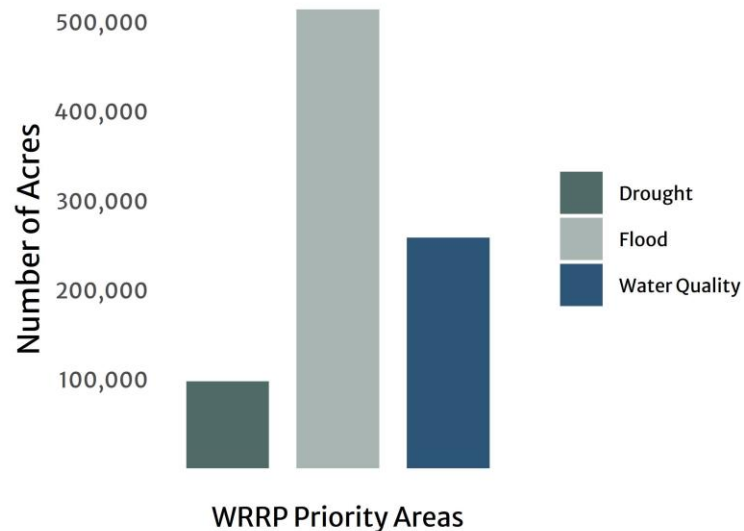


Figure 30. Number of acres of privately conserved land within areas of priority for drought and flood mitigation and maintaining water quality determined by the Government of Alberta's Watershed Resiliency and Restoration Program.

(Table 8, Figure 30).

The Government of Alberta's Watershed Resiliency and Restoration Program (WRRP) identified watersheds in the province that are priority for mitigating flood and drought and for maintaining water quality. More information about how those watersheds were scored can be found [here](#).

Our assessment of private land conservation in the high priority (5) watersheds indicated that almost 100,000 acres of drought priority areas (1.3% of total private land), over 500,000 acres of flood mitigation areas (0.5% of total private land) and nearly 250,000 acres of water quality mediating areas (0.93% of total private land) were conserved on private land

Wetlands

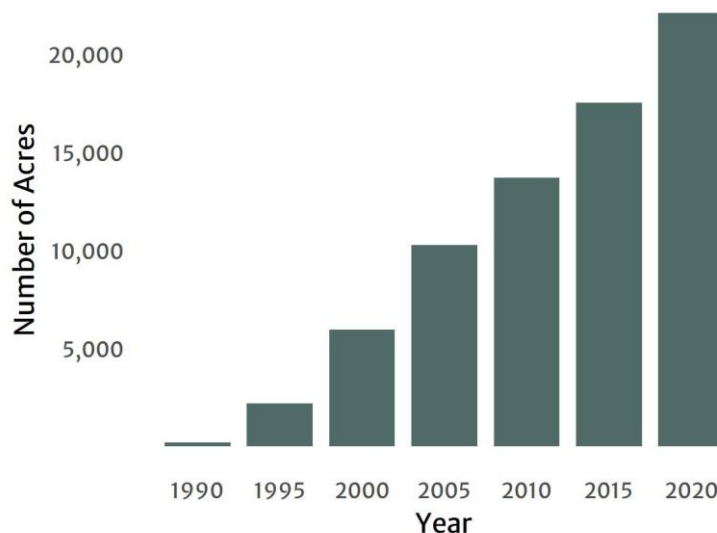


Figure 31. Acres of wetlands on private land throughout Alberta that are conserved through PLC.

Wetlands are an integral part of a healthy, resilient watershed. They are considered natural infrastructure for mitigating drought and flood impacts, and provide water purifying services as they slow down water flow allowing sediment to settle out. Wetlands also provide habitat for many plant species that control nutrient levels and remove toxins from the water.

Our assessment of private land conservation relating to wetlands found that 30,571 acres of wetlands are protected Alberta-wide (Figure 27, Table 7).

From 1990 to 2020, wetland protection through private land conservation has increased from 196.5 to 22,085 acres (Figure 31).

Hydrologically Significant Areas

Hydrologically significant areas were defined and estimated by Nature Conservancy Canada for the Red Deer, Bow and Oldman River watersheds. They are defined as areas containing natural assets that provide hydrological services such as maintaining water quality and quantity. More information about the development of the hydrologically significant areas along with basin-specific reports can be found [here](#). Private land conservation protects 234,704 acres of hydrologically significant areas, representing 4.73% of private land within that area (Figure 27, Table 8).

Human Well-being

Human well-being metrics

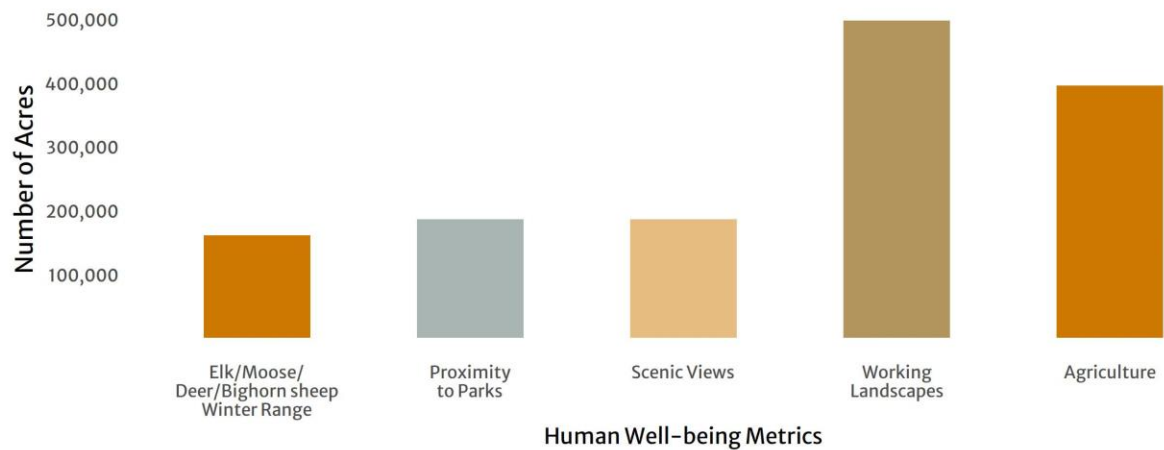


Figure 32. Acres of private land conservation for all metrics under the human well-being theme presented using the same scale to improve comparability.

Table 9. Acres and percent of private land conservation, and acres of total private land for the human well-being theme.

Metric Name	Private Land Conservation		Private Land (Total)
	Acres	Percent of private land	Acres
Agriculture	395,383		
Proximity to Parks	186,044	3.35	5,555,354
Scenic views	185,985	7.20	2,584,587
Sustainable hunting – elk, moose, deer, bighorn sheep	160,540	7.41	2,167,873
Working landscapes	497,723		

Sustainable Hunting

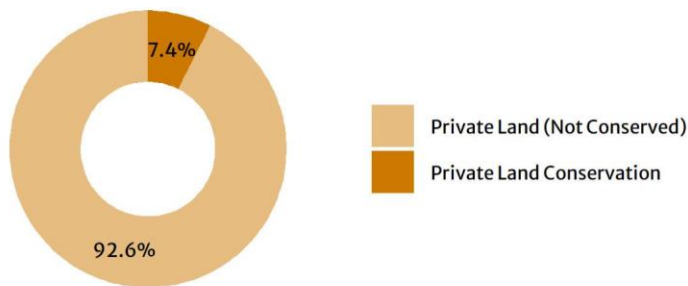


Figure 33. Percentage of the private land within the winter range for elk, moose, deer and bighorn sheep that is privately conserved, supporting healthy populations and sustainable hunting.

The sustainable hunting metric reflects the amount of PLC conserving lands in the winter range for elk, moose, deer and bighorn sheep, which was also presented under the biodiversity theme. Private land conservation in these regions supports healthy populations which has benefits for human well-being through also supporting sustainable recreational hunting opportunities.

Over 7% of private land within the winter range of those species is privately conserved

Table 9, Figure 33).

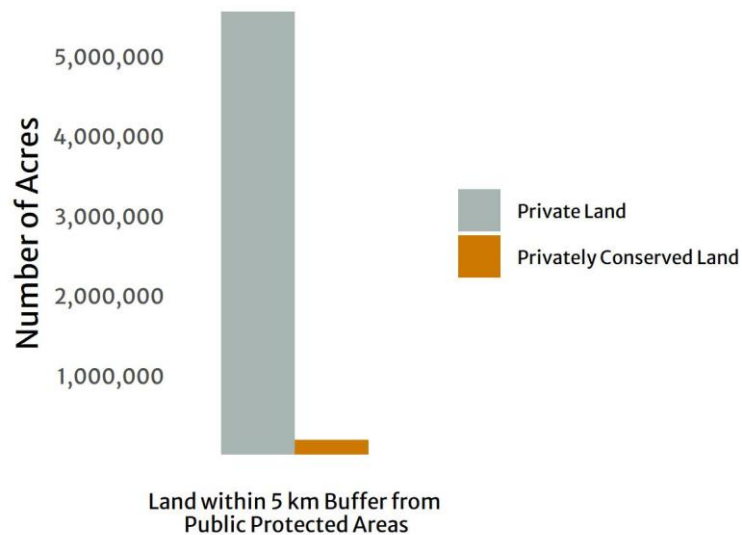


Figure 34. Number of acres of privately conserved land located within a 5 km buffer of parks and protected areas.

Proximity to parks

Private land conservation near other protected areas can amplify the effects of those protected spaces on biodiversity as was discussed above but can also have implications on human well-being by increasing open space and scenic views within the province.

PLC conserved 186,044 acres within the 5km buffer zones around parks and protected areas, accounting for 3.35% of the private land in that area (Figure 34, Table 9).

Scenic views

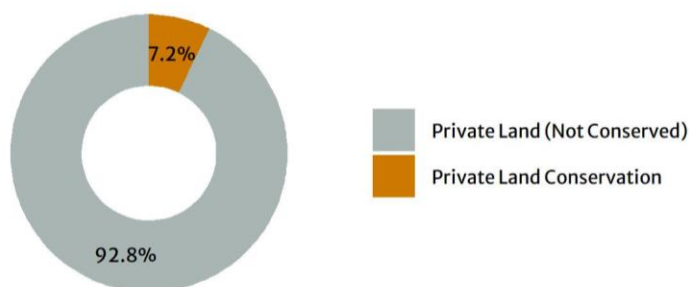
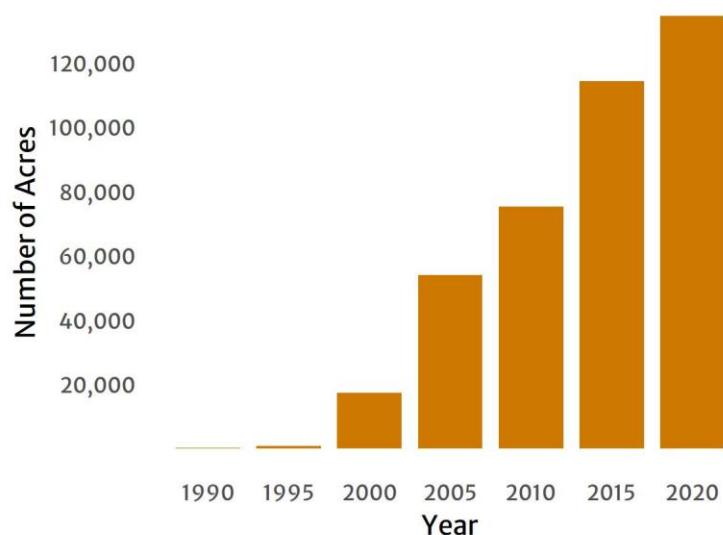


Figure 35. Percentage of private land within high value scenic areas that is protected through PLC.

Scenic views contribute to human well-being by improving human health outcomes (Seresinhe et al., 2015) and supporting tourism and recreation. We assessed the amount of PLC within areas with high visual value defined through an assessment conducted for the GoA as part of the Land Use Framework work completed in 2010 (O2 Planning + Design Inc., 2010). The analysis was completed for all watersheds in Alberta except for

Red Deer and combined scenic quality with visual sensitivity. Scenic quality is based on four known elements of attractiveness - water visibility, vegetation variety, terrain variation, and land use. Visual Sensitivity considers how visible a landscape is from important recreational use areas and scenic corridors (publicly accessible paved roads).

Our assessment indicated that 185,985 acres of land are conserved through PLC, accounting for 7.2% of private land in the areas identified as high value scenic lands (Table 9, Figure 5).



A temporal assessment indicated an increase in scenic lands conserved through PLC from 184 acres in 1990, to 134,432 acres in 2020 (Figure 36).

Figure 36. Acres of high value scenic views protected through PLC over time from 1990 to 2020.

Climate Change Resiliency

Impacts associated with climate change are increasing in frequency and severity. Private land conservation contributes in several ways to both climate change mitigation and climate change adaptation. On the mitigation side, conserving grasslands, forests and wetlands contribute to carbon storage. On the adaptation side, ecological connectivity and intact habitat will provide safe habitat for species to occupy as they navigate their own adaptation journeys. As well, undeveloped spaces – wetlands in particular – can receive water during times of high flow, and release water slowly increasing supply during times of drought.

Web Portal

An open-access [website](#) was developed to display key metrics results from the combined land trust data. The website presents graphs, maps and key messaging about private land conservation in Alberta



[About](#) [Partners and Funders](#) [Metrics Themes](#) [Case Studies](#) [Resources](#)

Explore how private land conservation in Alberta supports biodiversity, watershed resiliency, and human well-being. Through carefully developed metrics, this site highlights the contributions of land trusts and private land conservation efforts, showcasing their value to Alberta's landscapes and communities.

STEP 1: CHOOSE ONE OF THESE FOUR THEMES TO START



STEP 2: SELECT A FILTER

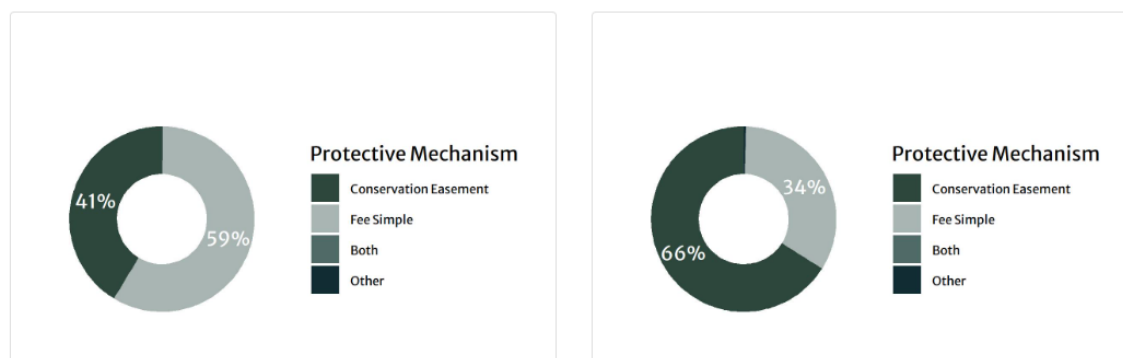
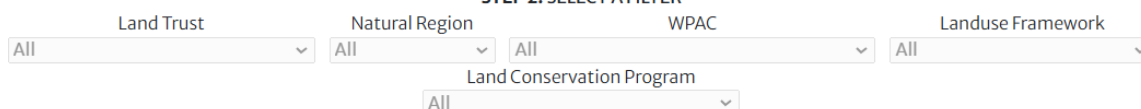


Figure 37. Home page of private land conservation metrics [website](#). Links at the top of the webpage allow the user to visit the [About](#) and [Partners and Funders](#) pages to learn more about the project. The [Metrics Themes](#) link provides more detail about the metrics and a link to download this report. And [Case Studies](#) link provides a more in-depth look at the value provided by private land conservation using specific examples that go beyond metrics. Step 1 allows users to view high-level metrics in the [At a Glance](#) section or select from the four themes: [biodiversity](#), [watershed resiliency](#), and [human well-being](#).

at a glance and how it contributes to the three themes: biodiversity, watershed resiliency, and human well-being (Figure 37).

Filters

While this technical report displays only the high-level results for Alberta or some regions when relevant (e.g., hydrologically significant areas), the website shows each metric, when feasible, broken down further based on various filters (Figure 38). The filters include land trust, natural region, watershed planning and advisory council, land conservation program with a separate filter for ECCC's Ecological Gifts Program and the Alberta Land Trust Grant Program, and Land-use Framework.

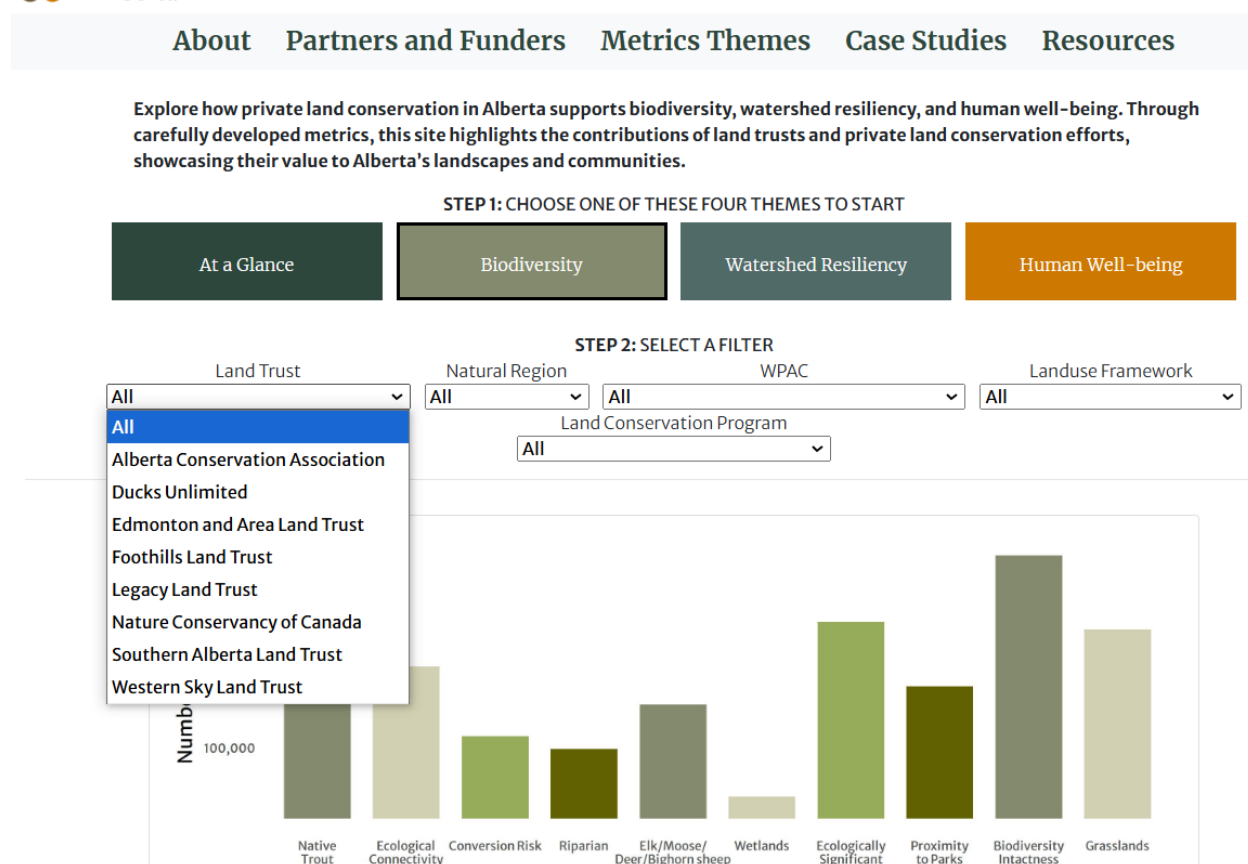


Figure 38. Demonstration of the dropdown menu under the Land Trust filter. When a land trust is selected, the resulting figures will only show data from that land trust. There are similar filters for each of the natural regions, watershed planning and advisory councils, and land conservation program (Ecological Gifts Program, Alberta Land Trust Grant Program).

Case studies

Case studies were developed to present more in-depth examples and provide more context for some benefits of private land conservation and are presented on a case study-focused page on the website. These case studies are available for the land trusts to use as specific examples to highlight the benefits of their work.

The impact private land conservation has on conservation goes beyond numbers. We used case studies to bring this impact to life with stories of privately conserved lands in Alberta. In each case study, we explore the story that the local landscape holds, and explain the significance of the role that private land conservation has played. In many of these cases, the conservation goal of that landscape would not have been achieved without private land conservation.

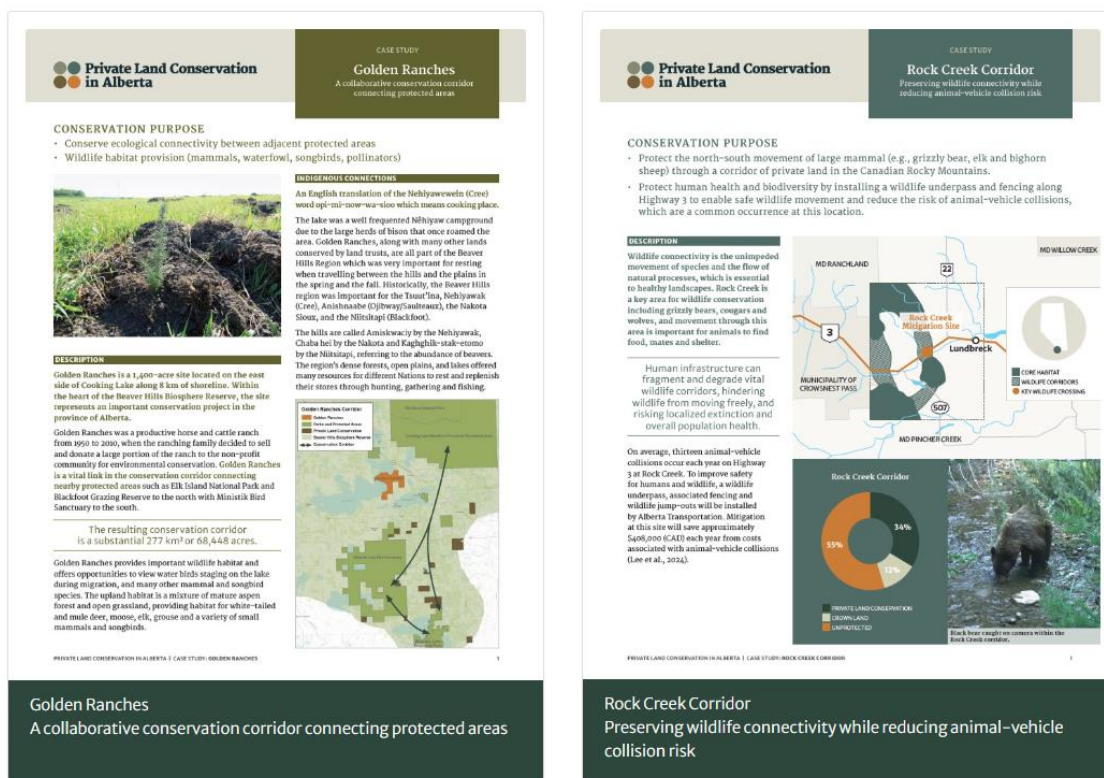


Figure 39. Screen capture of case studies available on the website.

One-pagers

We developed several one-pagers to provide a quick overview of the contributions of private land conservation in Alberta. These include an overview of PLC, overviews of each theme, understanding PLC as working landscapes, and a temporal assessment, and can be found on the resources page of the website.

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Appendix



Figure 40. **Agricultural conversion risk** predicted by Olimb & Robinson (2019).



Figure 41. ABMI's **biodiversity intactness** index for with values >75 indicating areas where current biodiversity estimates are similar to historical estimates.



Figure 42. Areas with an **ecological connectivity** z-score >1 modelled by Marrec et al., (2020)



Figure 43. Elk, moose, deer and bighorn sheep winter range.



Figure 44. Government of Alberta identified environmentally significant areas.



Figure 45. **Fish:** Watersheds where adult densities of at-risk native trout (Arctic Grayling, Athabasca Rainbow Trout, Bull Trout Westslope Cutthroat trout) were classified as low, very low, or extirpated. Classifications were derived from AEPA's Fisheries Sustainability Index available on FWIMT.

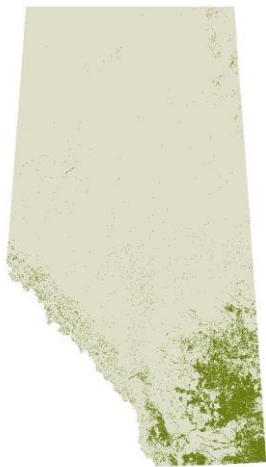


Figure 46. Agriculture and Agri-food Canada's Land Use Time Series – managed and unmanaged grasslands.



Figure 47. Headwater watershed identified as HUC10 watersheds within the Rocky Mountain natural region.



Figure 48. **Hydrologically significant areas** identified in the Oldman, Bow and Red Deer river watersheds only.



Figure 49. **Proximity to parks:** Federal and provincial parks and protected areas (light orange) and a 5 km buffer around those areas (dark orange).



Figure 50. **Riparian areas** throughout Alberta.



Figure 51. **Scenic views** identified as areas of important visual value

Drought

Flood

Water quality

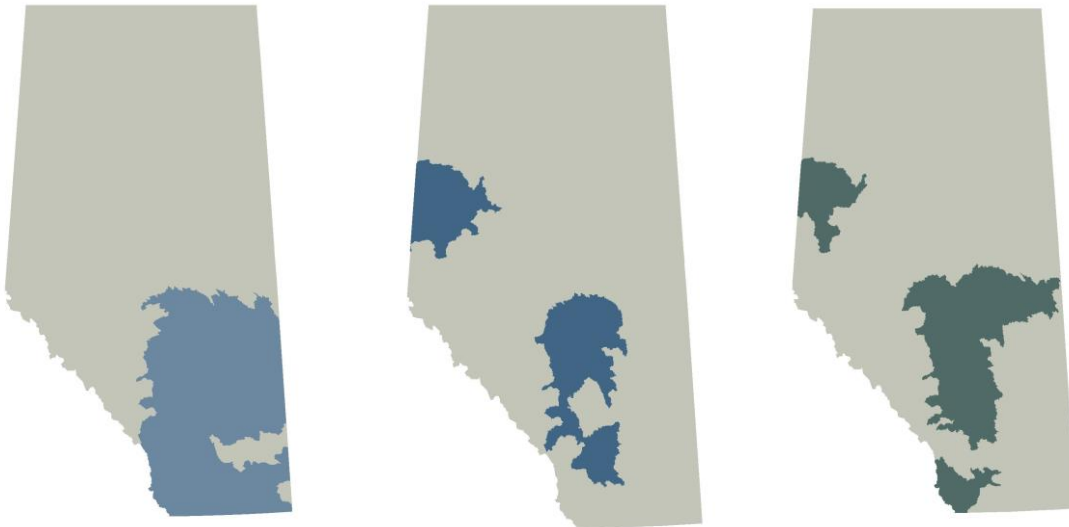


Figure 52. Priority watersheds for **mitigating drought and flood risk and maintaining water quality** identified by the GoA's Watershed Resiliency and Restoration Program. Areas shown had the highest priority score (5).



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