State of the Prairie

The Prairie Conservation Forum

The PCF Steering Committee and Technical Team

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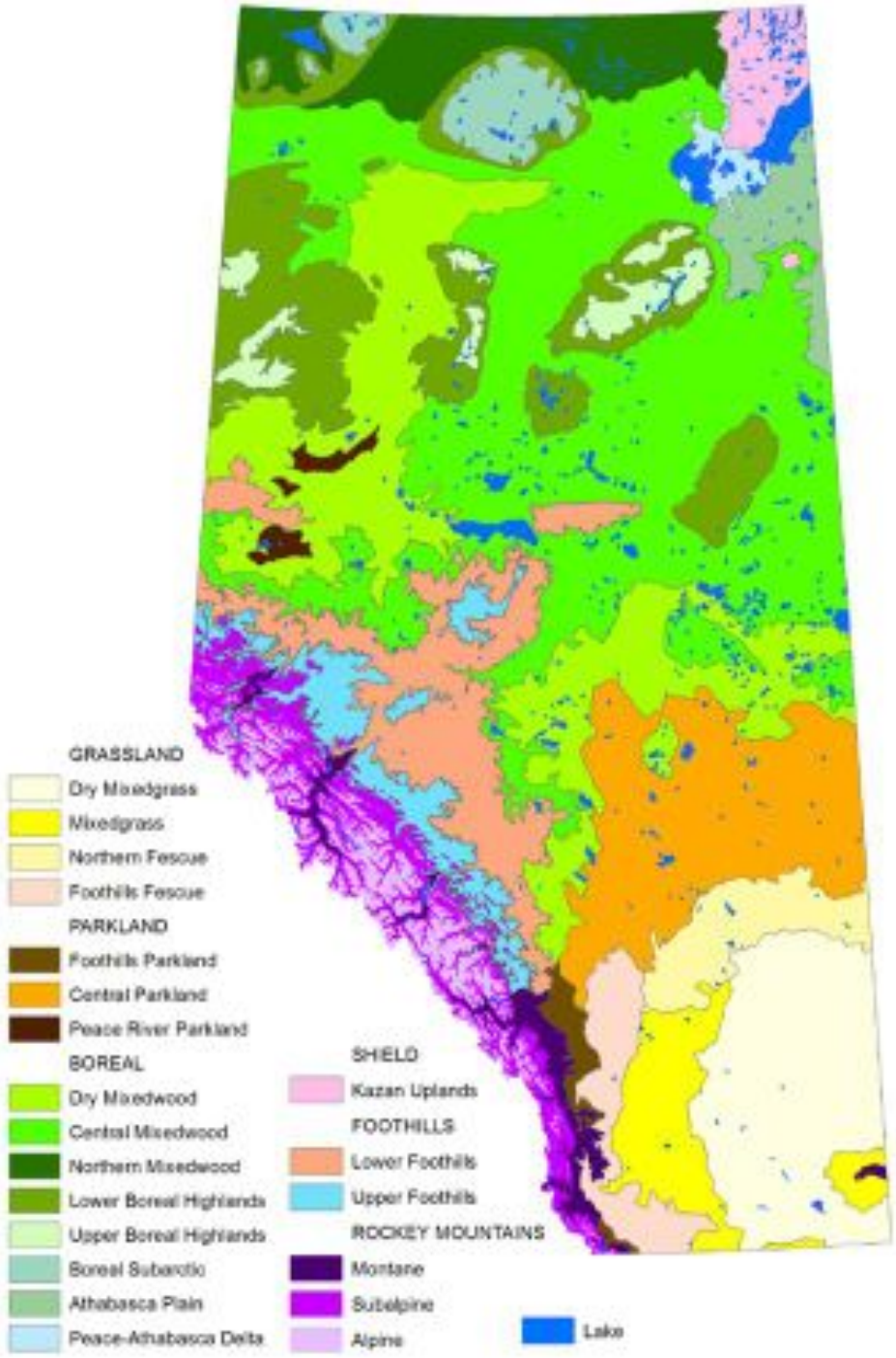
The Timescan data analysis also included personnel from:

German Aerospace Center (DLR), German Remote Sensing Data Center, Land Surface Department

Goals and Actions

- Evaluate native cover conditions in the **Grassland and Parkland Natural Regions of Alberta**
- Quantify the change and remaining native cover from the early 90's to present day
- Investigate the viability of the TimeScan data analysis process
- Adjust Ecodistricts areas.



- By Natural Region
- By Natural Sub-Region
- By Ecodistrict
- By Administrative Areas
  - By Municipalities and Counties
  - By Indian Reserves
  - By Military bases
- By Public vs Private

Data Sources (1)

Used in analyses

- Native Prairie Vegetation Inventory (NPVI)
- Grassland Vegetation Inventory (GVI)**
- PFRA 1995
- AAFC Annual Crop inventory 2016
- AAFC Land Use 1990 and 2010

Evaluated but not used

- ABMI Land Cover 2010
- ABMI Human Footprint (Inversed)
- Primary Land Vegetation Inventory (PLVI)**
- TimeScan various dates
- Central Parkland Vegetation Inventory (CPVI)
- Alberta Financial Services Corporation – insured crops (AFSC) 2006
- Cities of Calgary and Edmonton

** Validation Datasets

Data Validation – Examples

	AAFC 2015		AAFC 2016		AAFC 2017		TS 2015		HFI Negative 2014		ABMI Land Cover 2010		ABMI PLVI 2016	
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Shrub	180,263	8.9	118,370	5.8	179,234	8.8					46,562	2.3	113,991	5.6
Treed	62,319	3.1	80,454	4.0	84,962	4.2	50,391	2.5			93,133	4.6	221,596	10.9
Graminoid	280,323	13.8	349,270	17.2	366,313	18.0	174,506	8.6			316,800	15.6	198,153	9.7
Lake	38,412	1.9	29,838	1.5	47,419	2.3	39,791	2.0			71,215	3.5	61,928	3.0
Riparian														
Wetland	64,711	3.2	117,318	5.8	115,966	5.7	95	0.0					131,943	6.5
Total NPV	626,027	**31**	695,251	**34**	793,894	**39**	264,783	**13.0**	501,319	**24.7**	527,710	**26.0**	727,611	35.8
PLVI Area:	2,032,380													

	Landuse 1990		Landuse 2010		
	Area (ha)	%	Area (ha)	%	% Diff
Shrub					
Treed	81,666	0.9	77,576	0.8	0.0
Graminoid	4,338,372	45.4	4,094,117	42.8	-2.6
Lake	317,979	3.3	318,018	3.3	0.0
Riparian					
Wetland	86,729	0.9	85,049	0.9	0.0
Total NPV	4,824,747	**50.5**	4,574,761	**47.9**	-2.6
Grassland Area:	9,558,044				

	NPVI 1993		GVI 2016	
	Area (ha)	%	Area (ha)	%
Shrub	131,168	1.4	136,576	1.4
Treed	27,694	0.3	33,914	0.4
Graminoid	3,411,515	35.7	3,468,001	36.3
Lake	84,357	0.9	137,284	1.4
Riparian	123,421	1.3	210,528	2.2
Wetland	396,827	4.2	372,926	3.9
Total NPV	4,174,981	**43.7**	4,359,230	**45.6**

Data Sources (2)

	Time 1	Time2
Grassland –	NPVI (1991/93)	GVI (2006/16)
Grassland –	PFRA (1995)	AAFC Annual Crop Inventory (2016)
Grassland –	AAFC Land Use 1990	AAFC Land Use 2010
Parkland -	AAFC Land Use 1990	AAFC Land Use 2010

This presentation makes use of the data from the **AAFC Land Use** dataset for the following reasons:

1. It is the best Time 1 dataset of all the datasets evaluated
2. It is the only consistent Time 1 through to Time 2 dataset
3. The dataset covers both the Grassland and Parkland Natural Regions ie. it is consistent in both Natural Regions

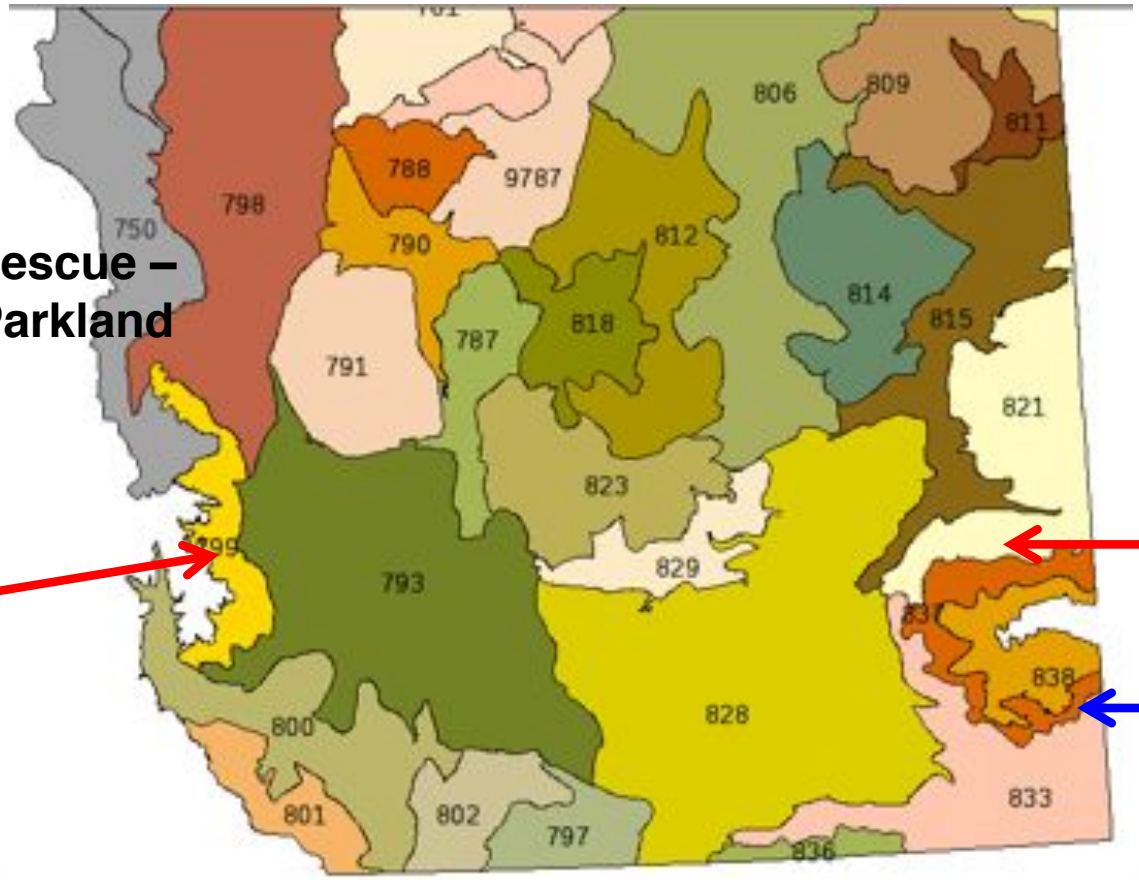
Data Standardization

- All datasets were remapped to the NPVI's 6 basic cover types:
  - Shrubs
  - Gramanoid
  - Lake/water
  - Riparian
  - Treed
  - Wetland

- The GVI was generalized from its minimum 2ha polygons to quarter section summaries to allow it to be compared to NPVI's quarter sections

- The satellite inventories were analysed at their native 30 metre pixel.

Grassland Ecodistrict Boundary Alignments



Foothills Fescue –
Foothills Parkland

Porcupine Hills

Shuler – Blindloss Plains

Cypress Slope

Sweetgrass Upland

The 'Big Picture' Results

➨The Grassland Natural Region has remained quite stable in terms of overall change in native cover; the relatively small increases or decreases are within the error margins of the data. The amount of native cover left in the Grassland Natural Region is about 48%.

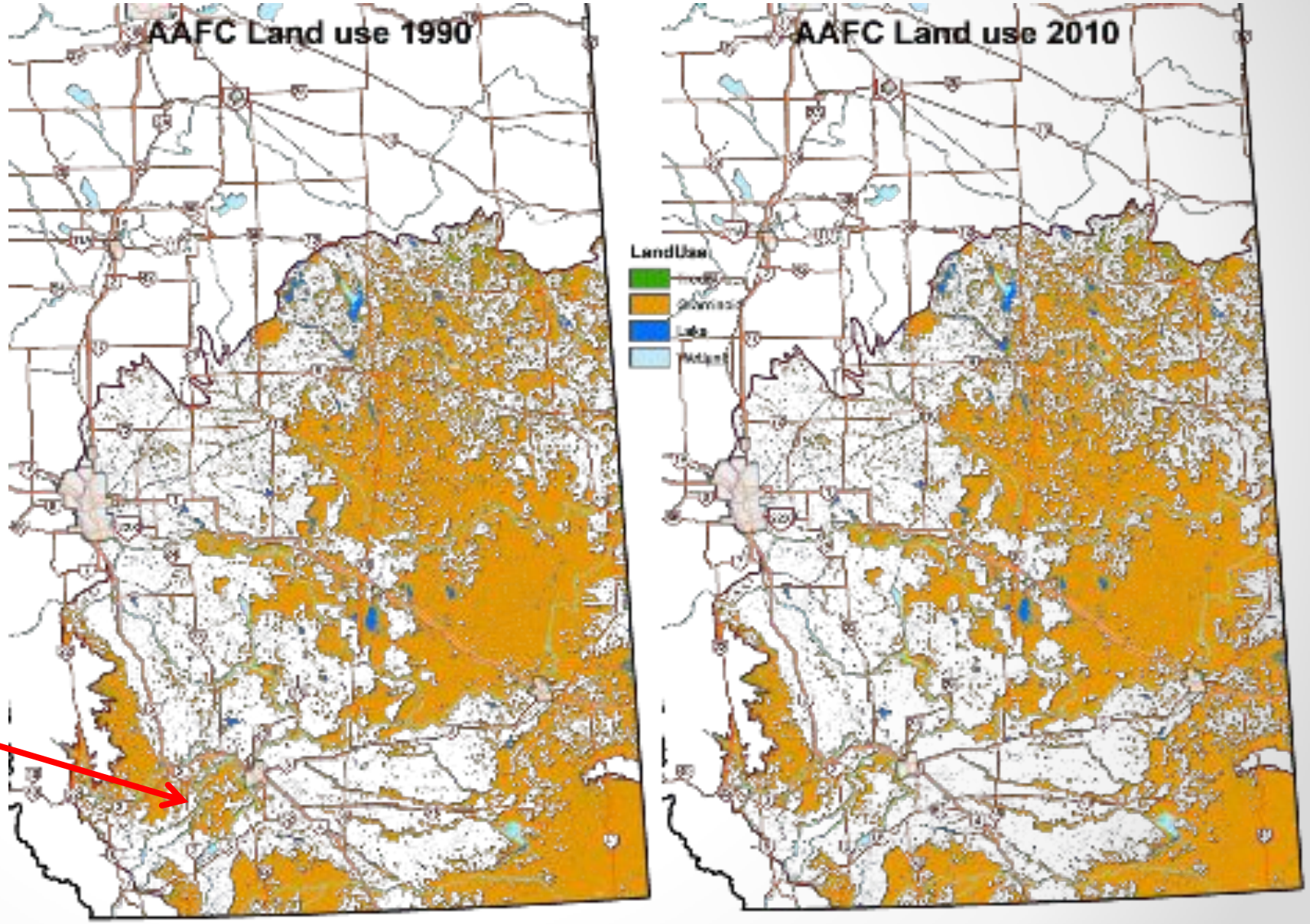
➨The Parkland Natural Region also showed similar insignificant change but the amount of native cover is quite compromised. The amount of native cover is 20% but is localized mostly in the east and SW part of the region. Most of the region contains 10-15% native cover.

➨The greatest change in native cover was on some of the Indian Reservations; the Blood IR lost almost 20% in twenty years. The greatest amount of native cover was found on the large military bases; CFB Suffield (98%), and CFB Wainwright (92%).

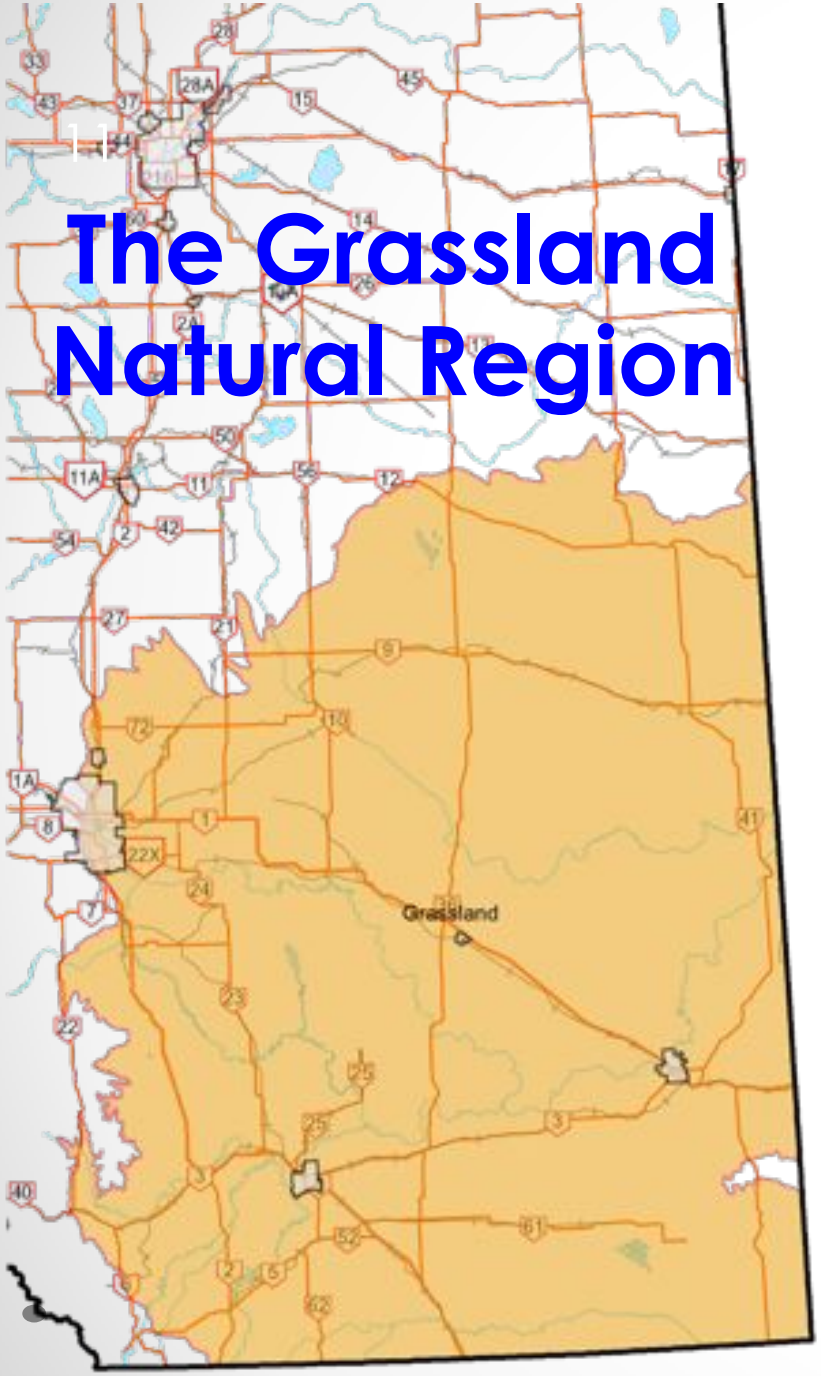
The Grassland Natural Region: The General View

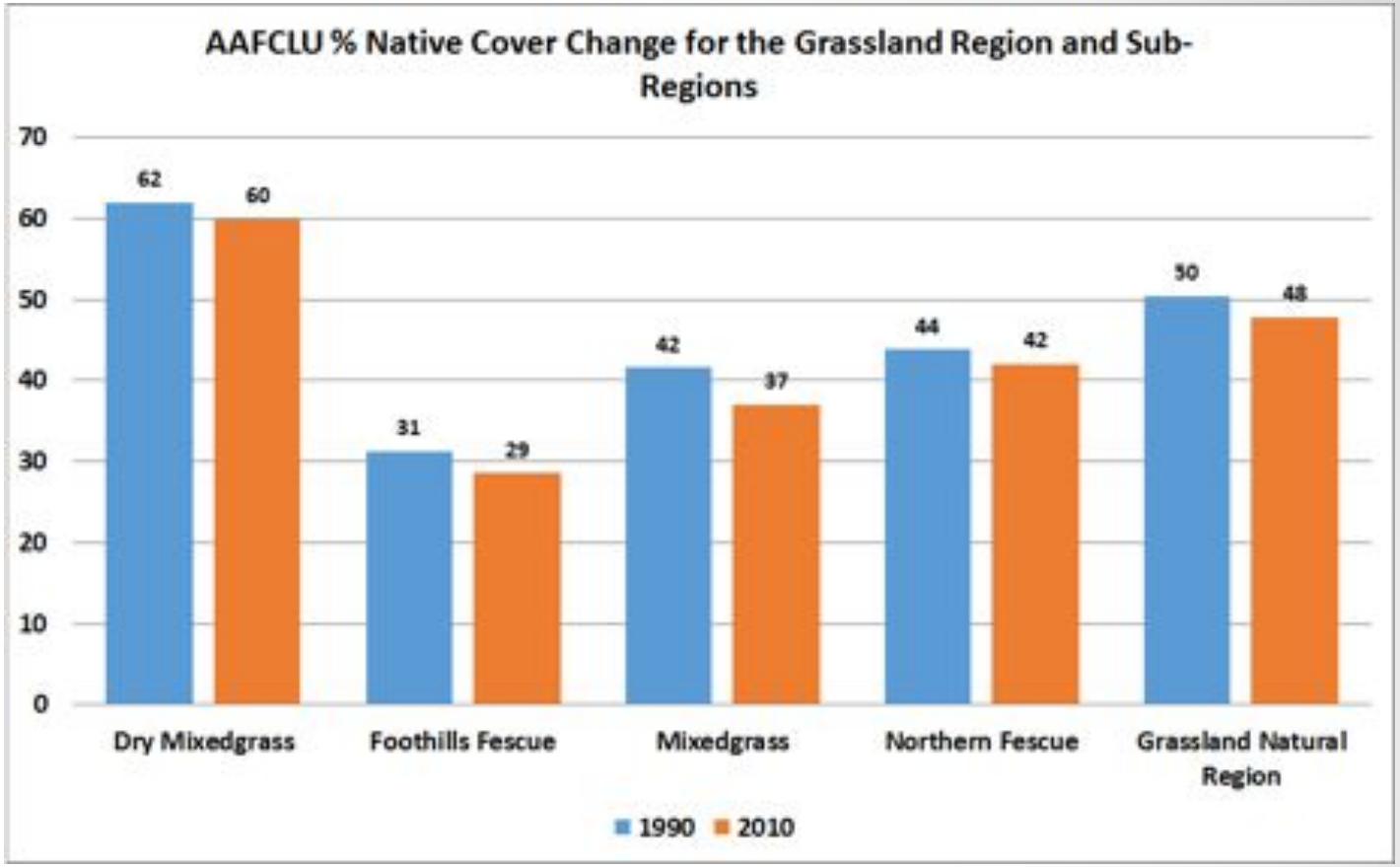
- Very little change is observed at the Natural Region scale

- The only area where there is visible change (loss) at this scale is on the Blood Indian Reserve

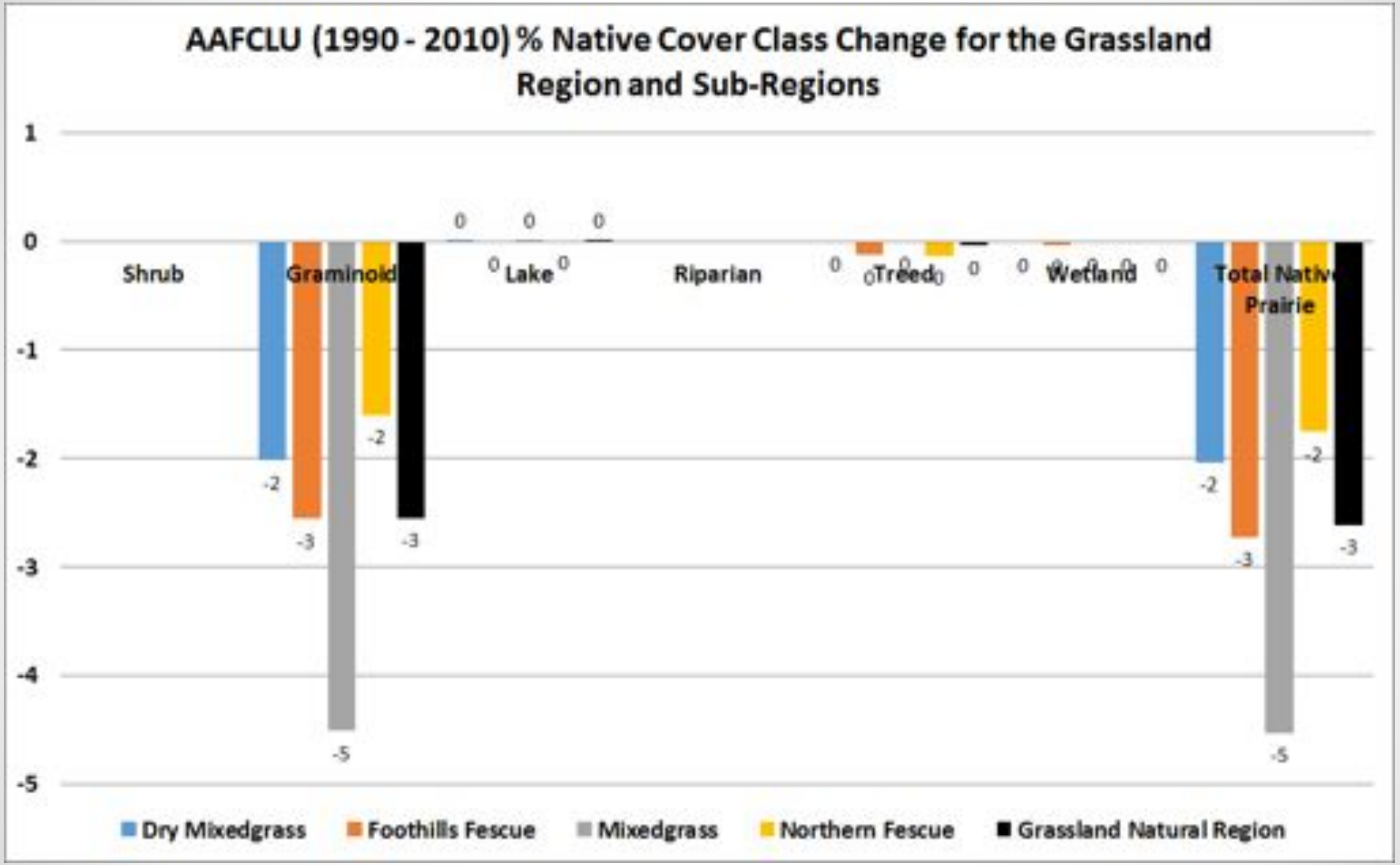


The Grassland Natural Region

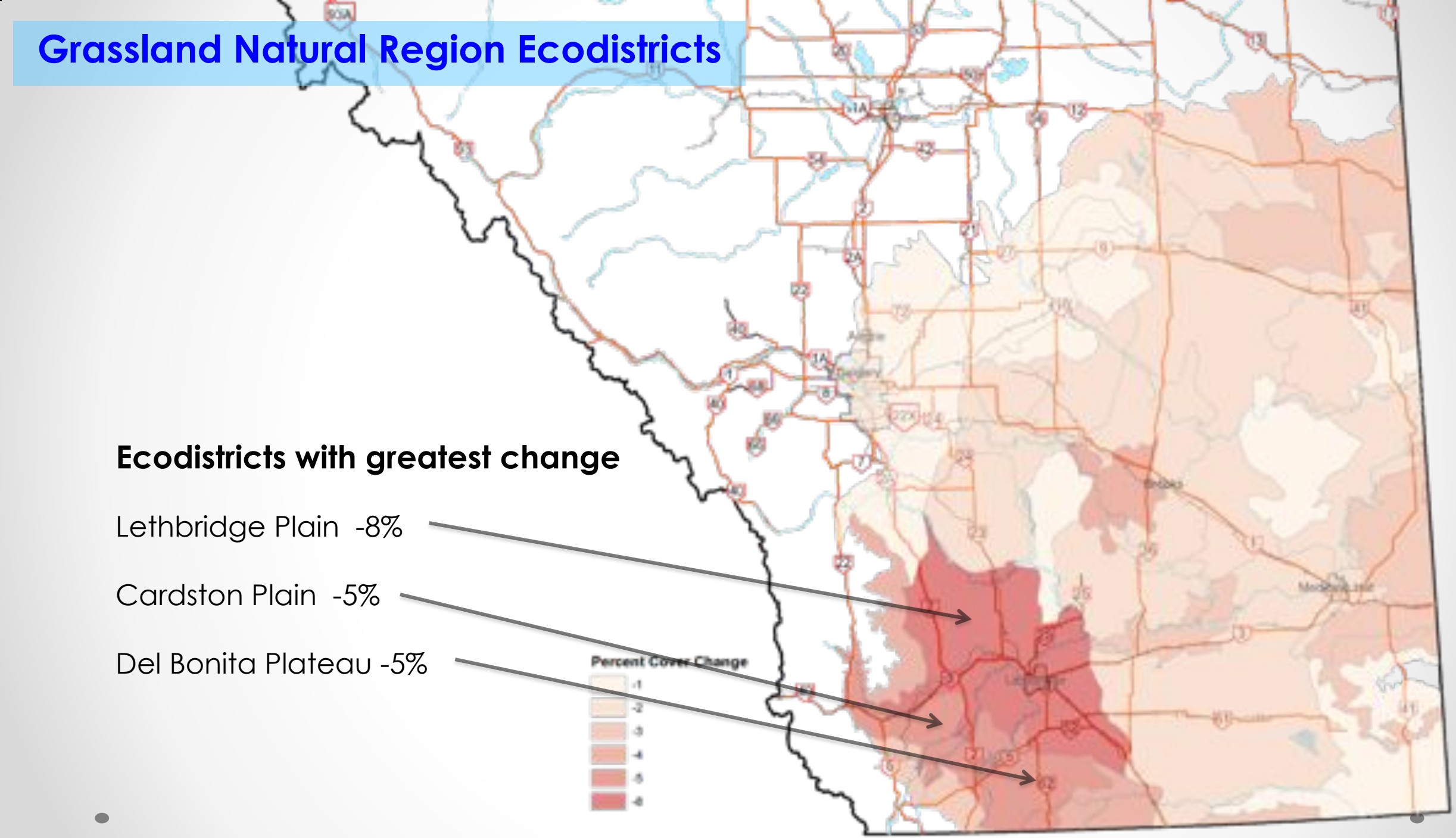




The Grassland Region and its Sub-Regions showing a small overall 2% insignificant loss in Native Cover between the years 1990 and 2010


AAFCLU (1990 - 2010) % Native Cover Class Change for the Grassland Region and Sub-Regions
1
0
-1
-2
-3
-4
-5
Shrub
Graminoid
Lake
Riparian
Treed
Wetland
Total Native Prairie
-2
-3
-5
-2
-3
-2
-3
-5
-2
-3
Dry Mixedgrass
Foothills Fescue
Mixedgrass
Northern Fescue
Grassland Natural Region

Grassland Natural Region Ecodistricts



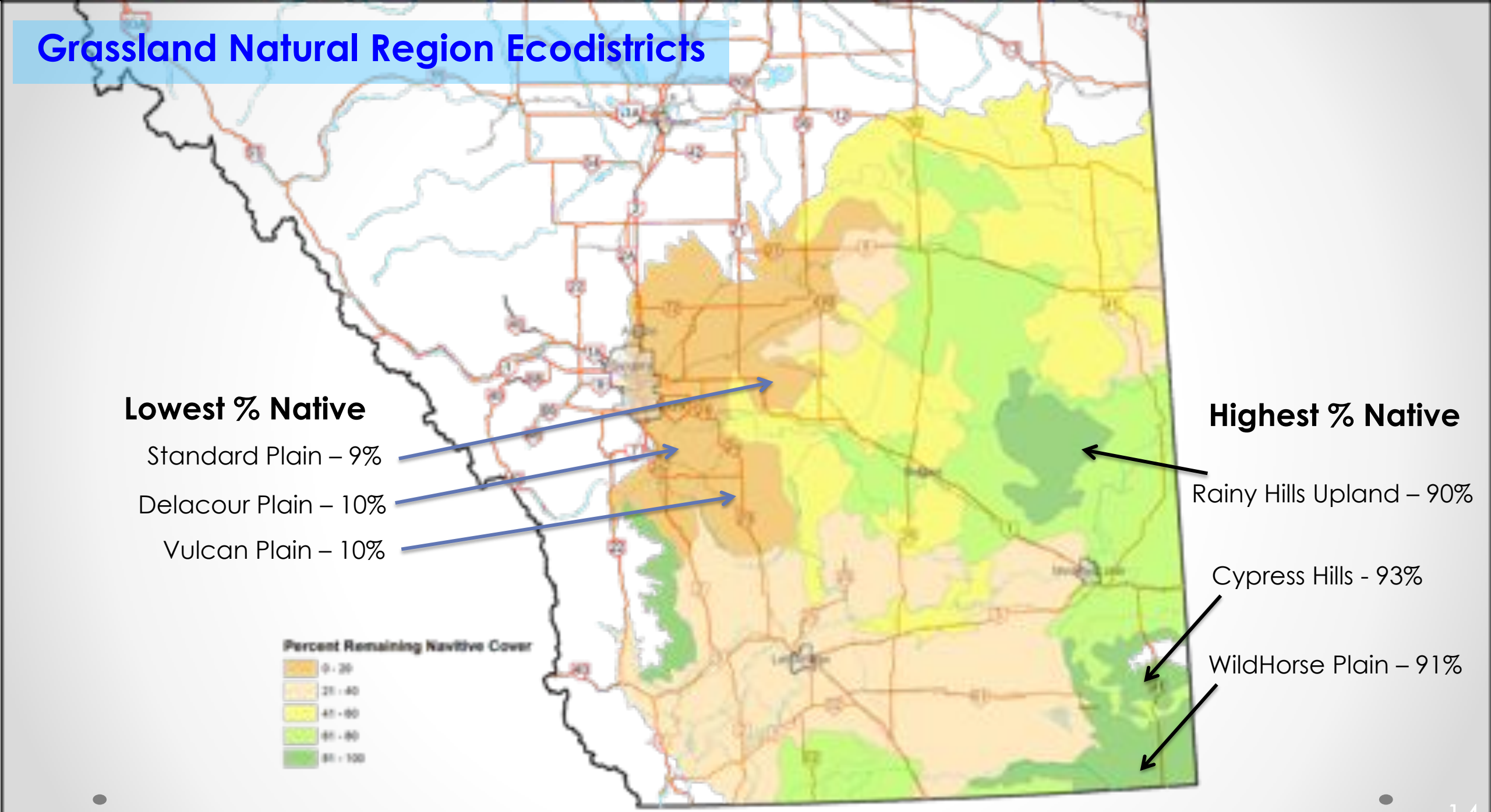
Ecodistricts with greatest change

Lethbridge Plain -8%

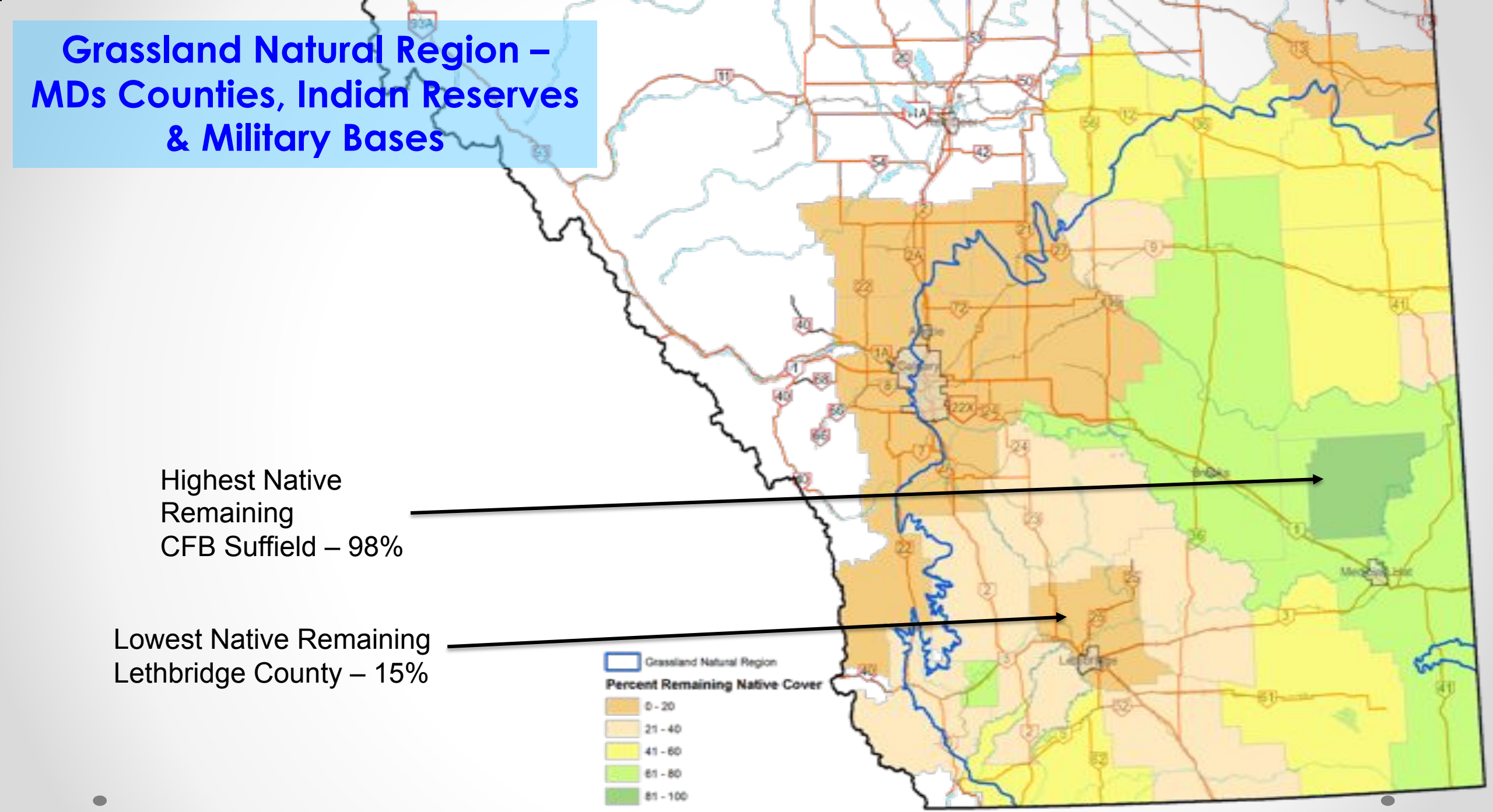
Cardston Plain -5%

Del Bonita Plateau -5%

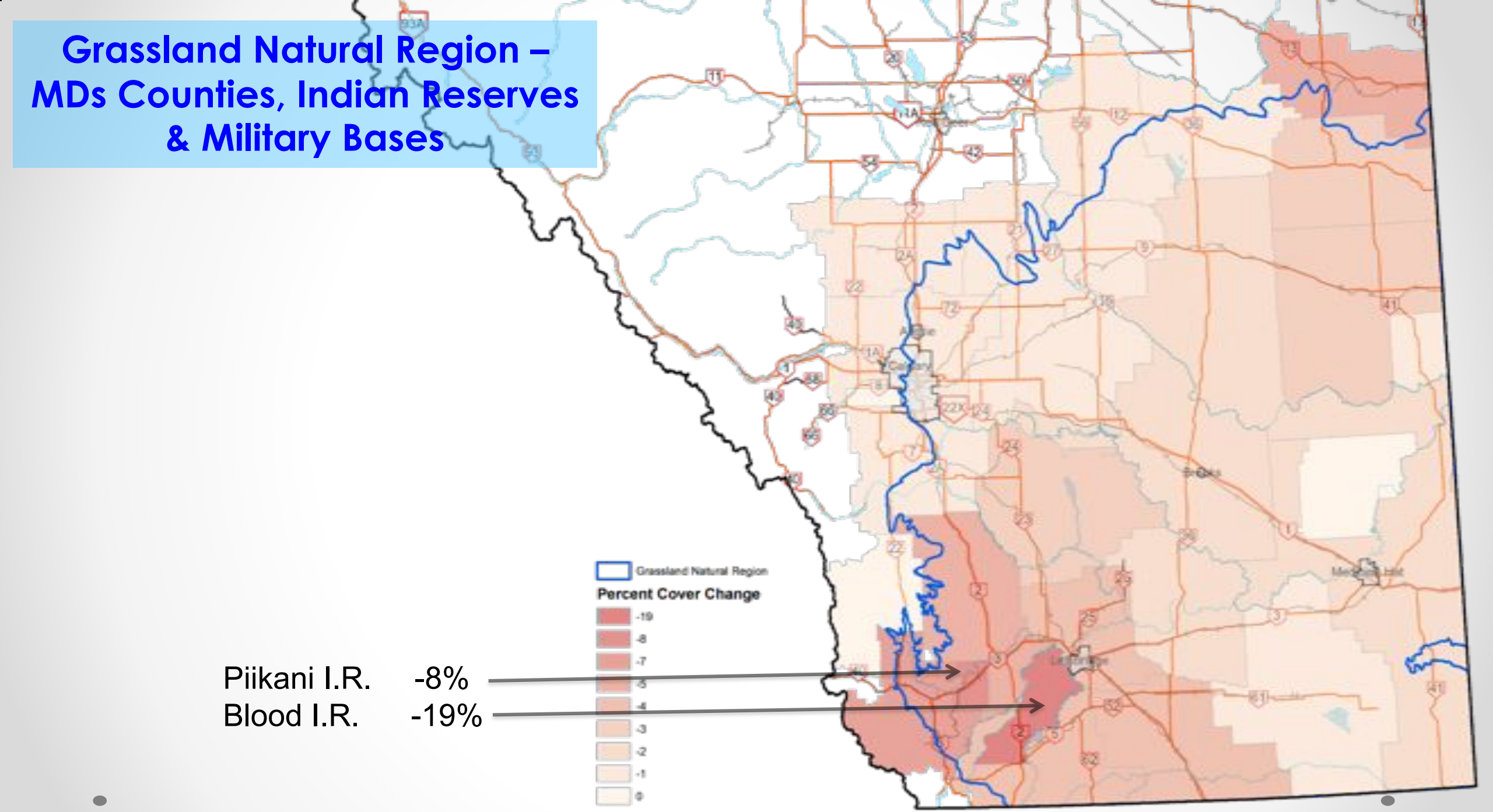
Grassland Natural Region Ecodistricts



Grassland Natural Region – MDs Counties, Indian Reserves & Military Bases



Grassland Natural Region – MDs Counties, Indian Reserves & Military Bases

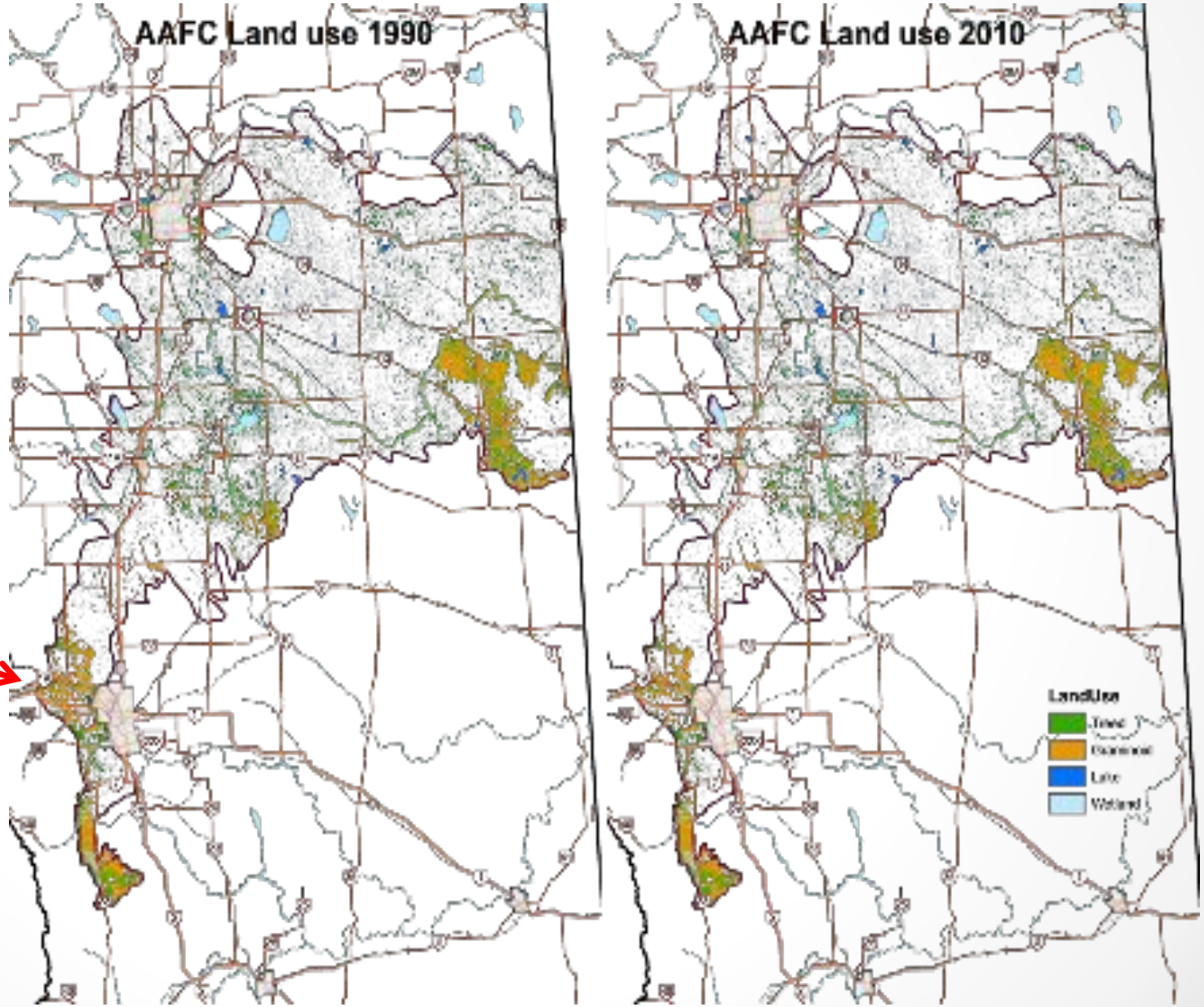


Piikani I.R. -8%

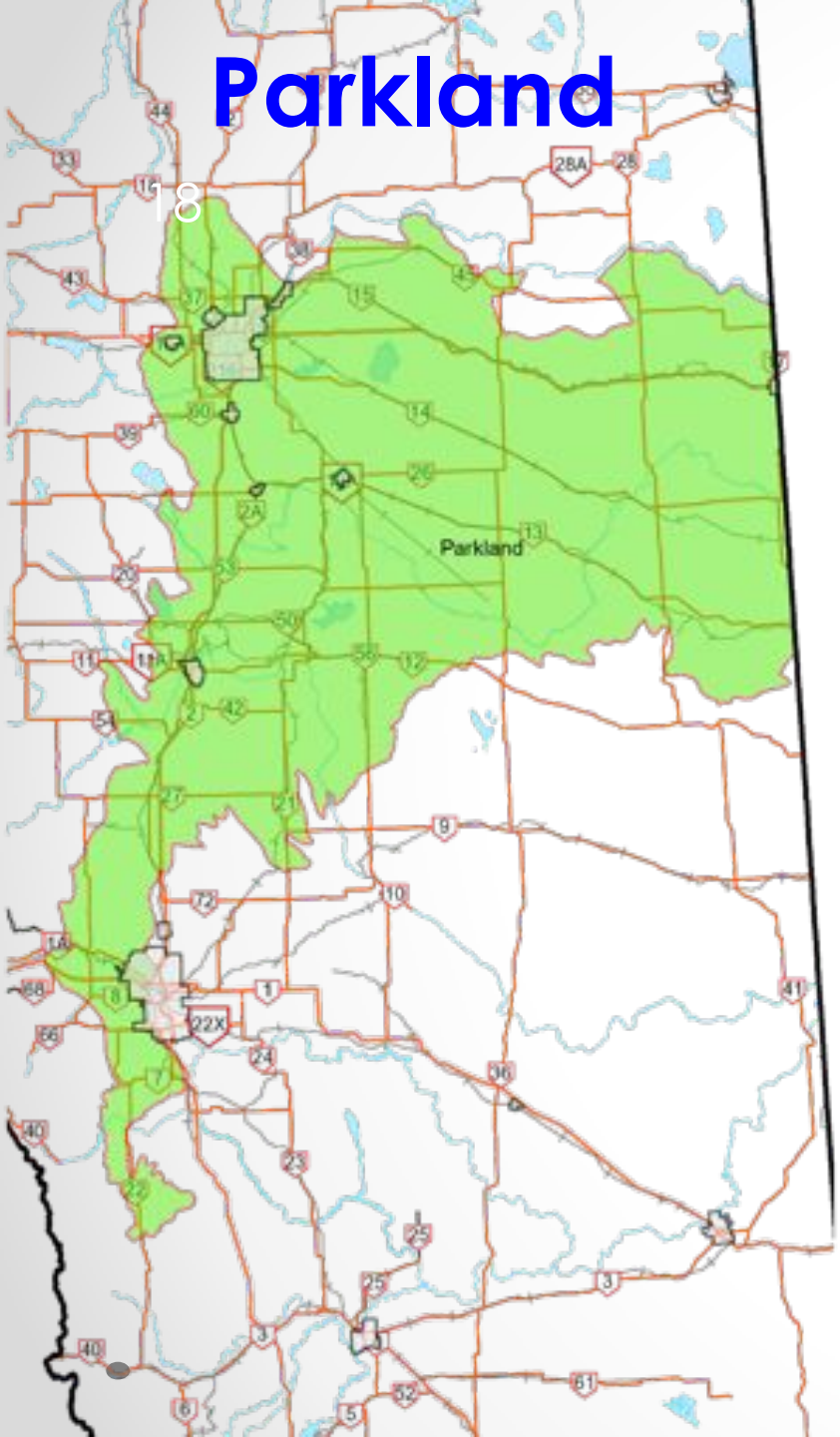
Blood I.R. -19%

The Parkland Natural Region: The General View

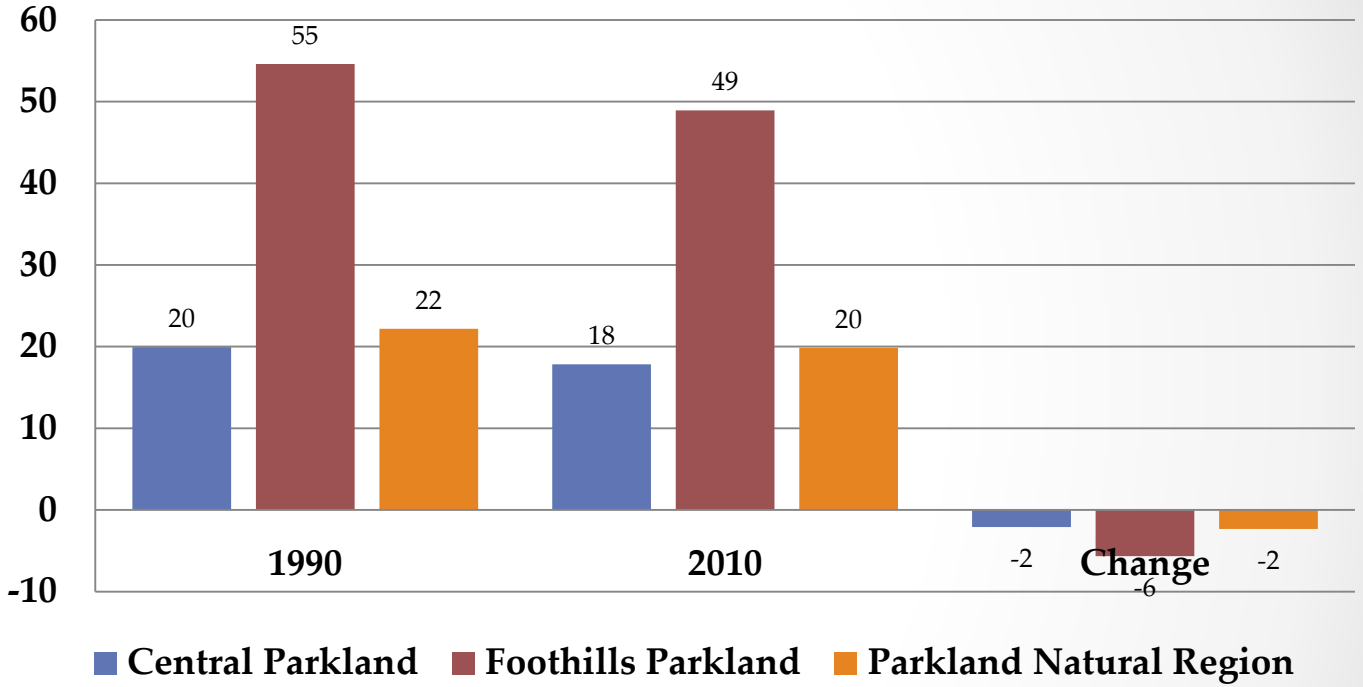
- Very little change is observed at the Natural Region scale
- Greatest loss is observed in the areas west of Calgary



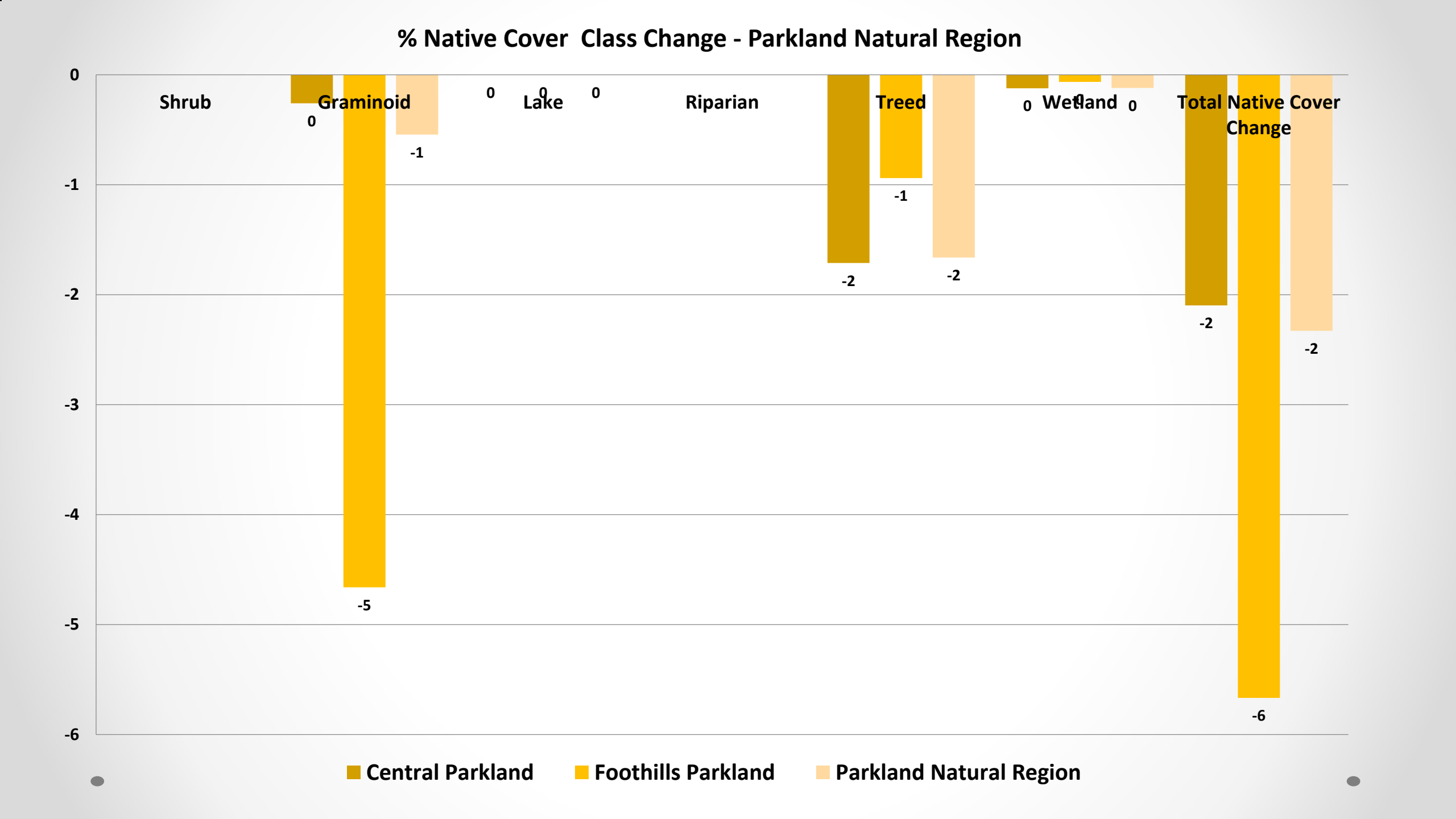
Parkland



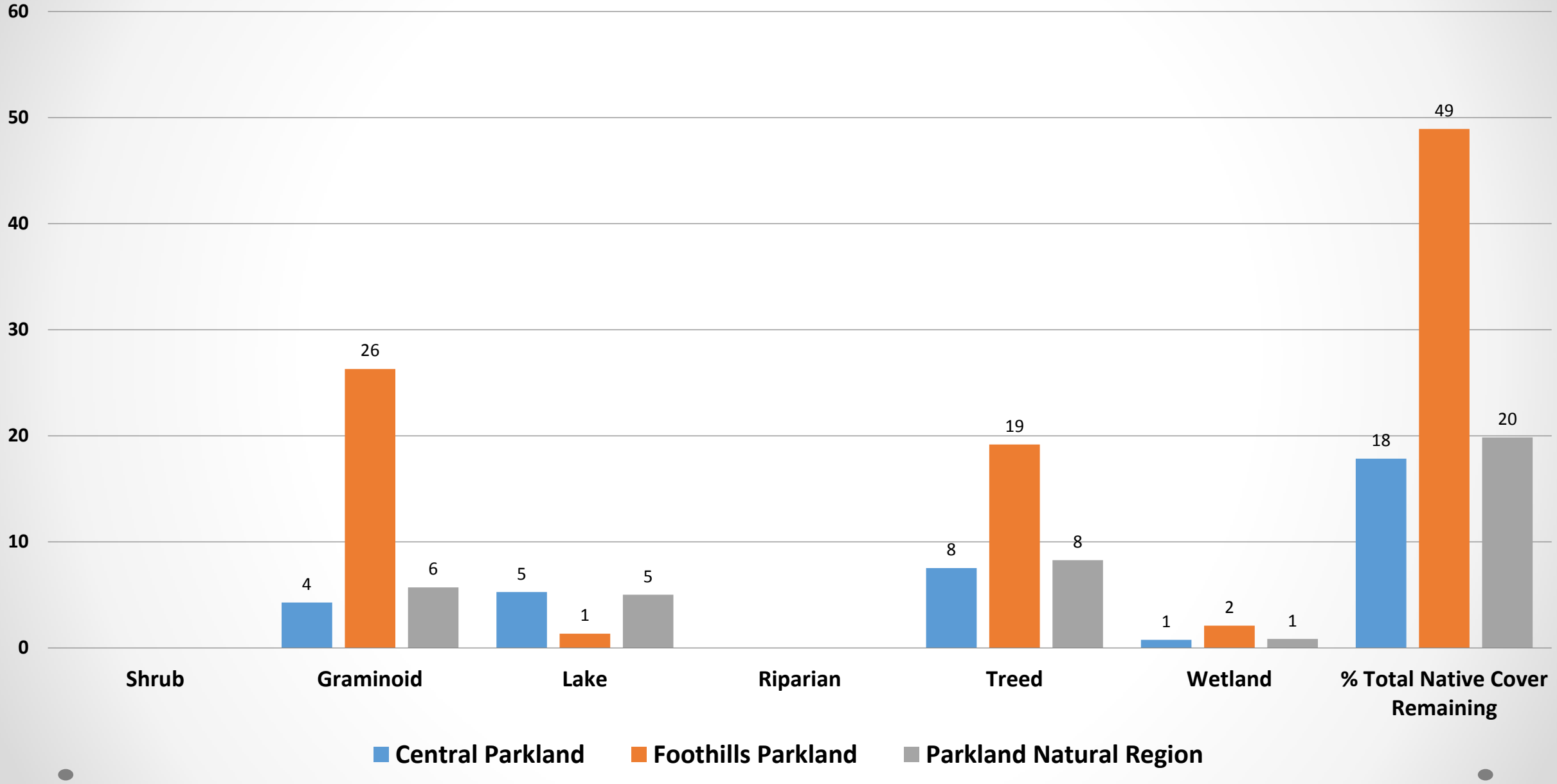
% Remaining Native Cover for the Parkland Natural Region and Sub-Regions



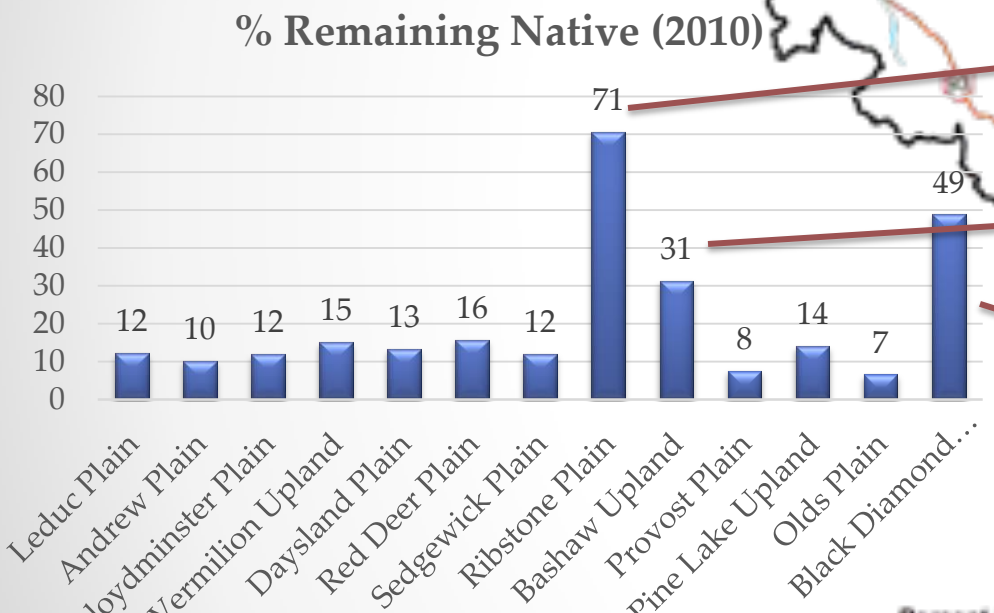
The Parkland Region and its Sub-Regions also showing a small (-2%) insignificant loss in Native Cover between the years 1990 and 2010


% Native Cover Class Change - Parkland Natural Region
0
-1
-2
-3
-4
-5
-6
Shrub
Graminoid
Lake
Riparian
Treed
Wetland
Total Native Cover Change
0
0
-1
0
0
0
-2
-1
-2
0
0
0
-2
-6
-2
Central Parkland
Foothills Parkland
Parkland Natural Region

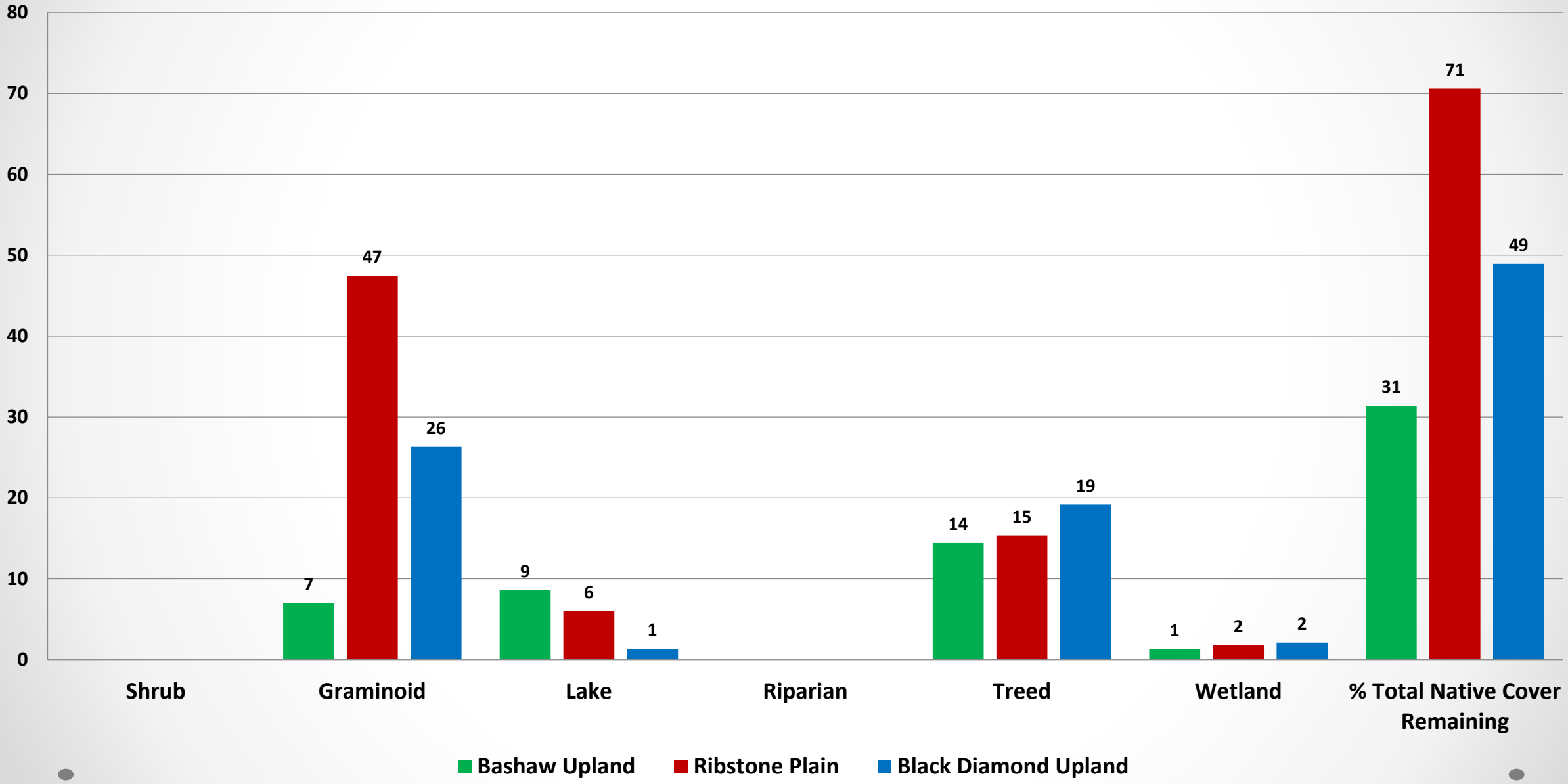
% Total Native Cover Class Remaining - Parkland Natural Region



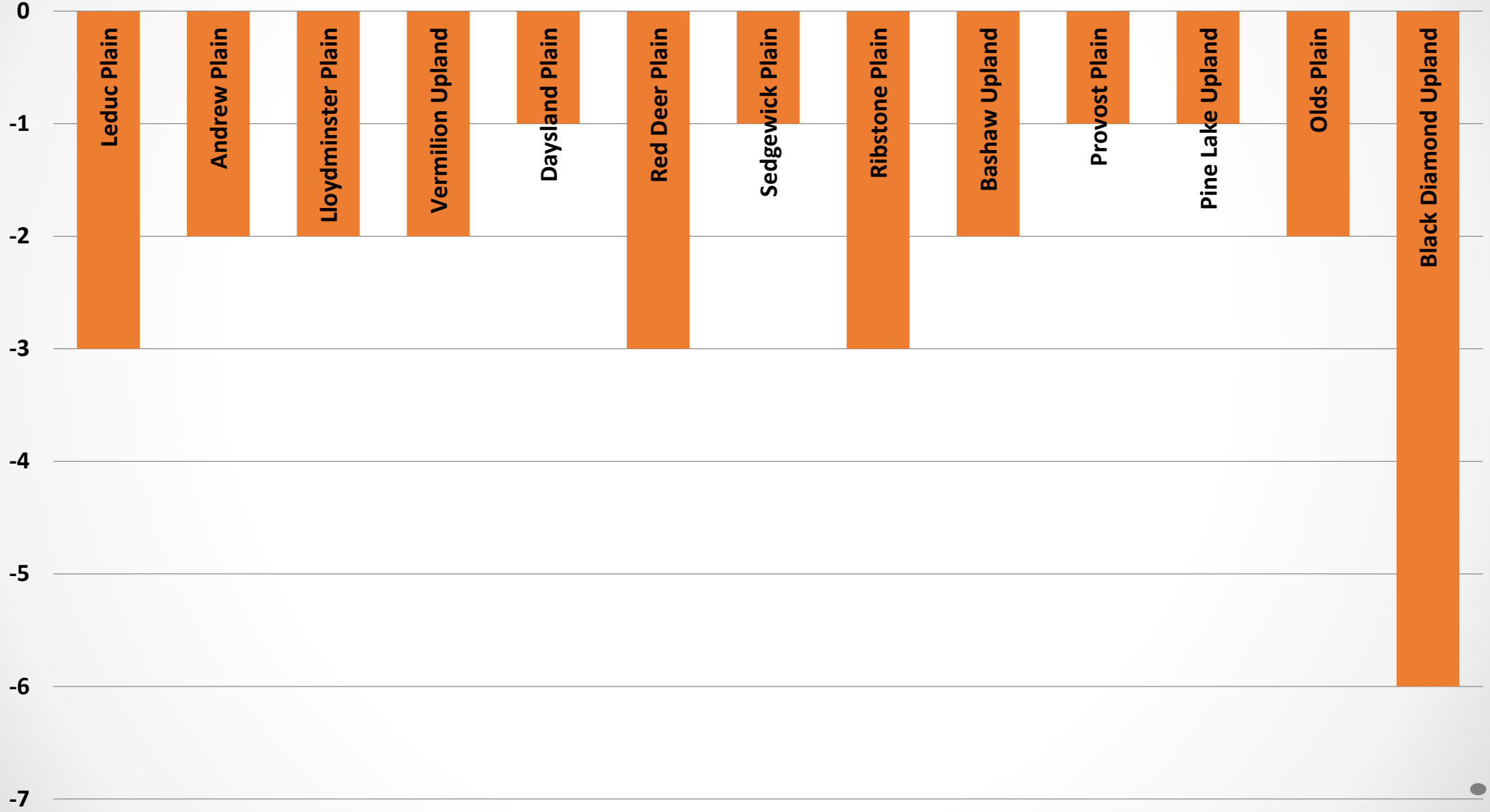
Parkland Natural Region Ecodistricts



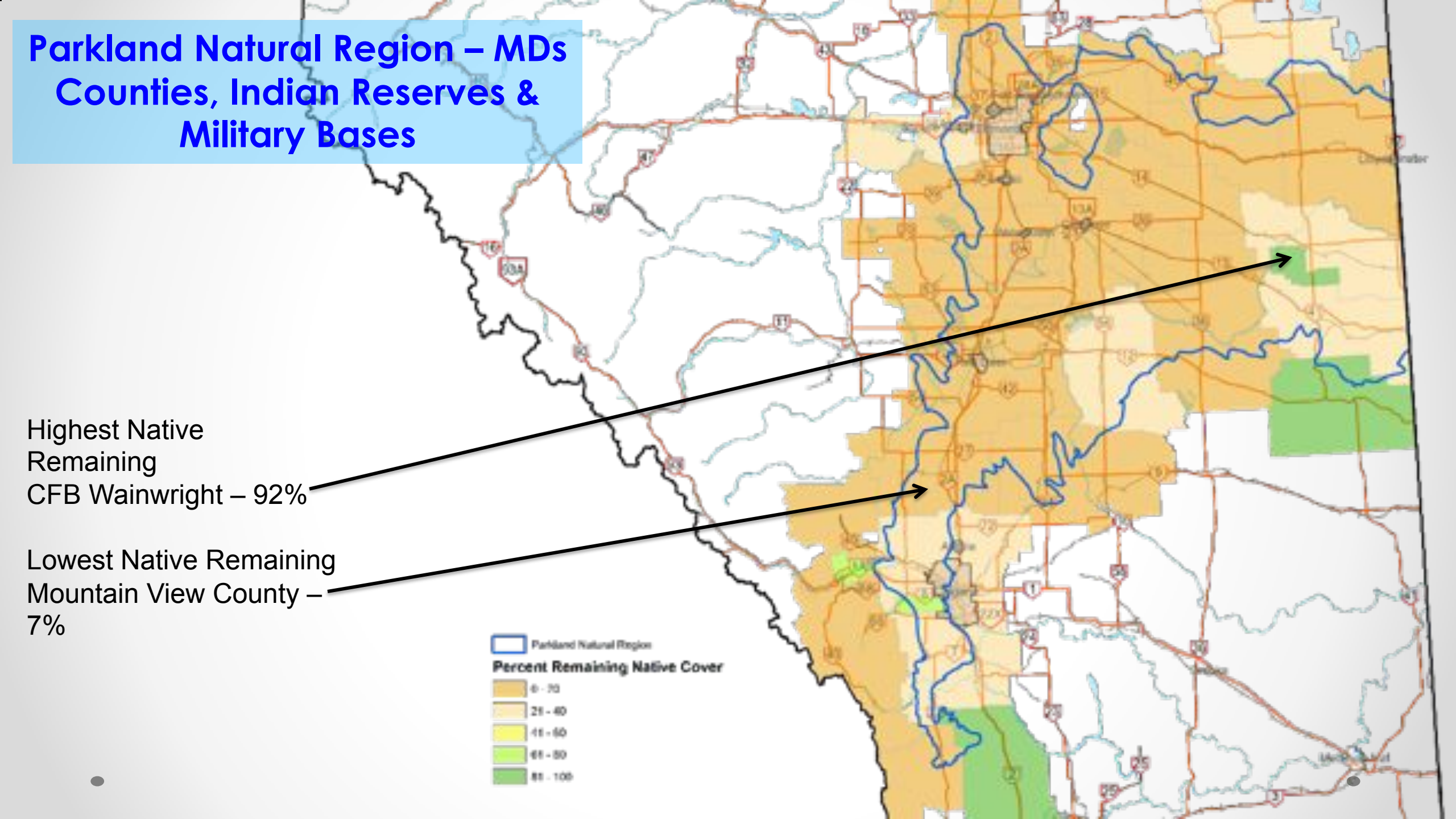
% Native Cover Remaining in the Ribstone Plain and the Bashaw and Black Diamond Uplands



Percent Change Native Cover for Parkland Natural Region Ecodistricts

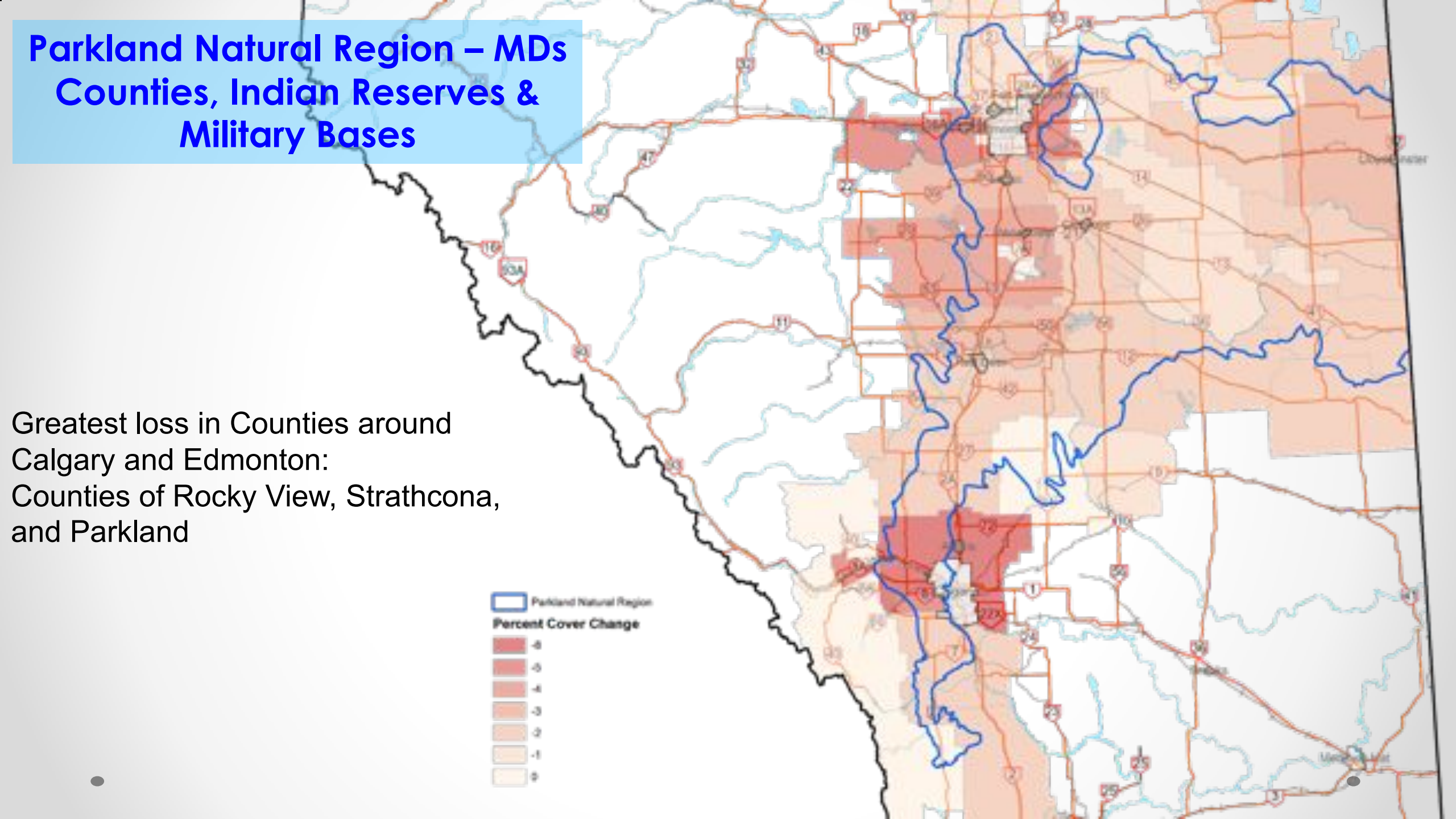


Parkland Natural Region – MDs Counties, Indian Reserves & Military Bases



Parkland Natural Region – MDs Counties, Indian Reserves & Military Bases

Greatest loss in Counties around Calgary and Edmonton:
Counties of Rocky View, Strathcona, and Parkland



A Public Lands versus Private Lands View: Grassland

Quick Facts

The loss of native is insignificant for both public (-0.6%) and private (-2%) lands.

The amount of native cover is not too different for both public and private 26.5% vs. 21.3%, respectively.

Much of the land is privately held (almost 70%)

Grassland NR	AAFCLU 1990	% in 1990	AAFCLU 2010	% in 2010	% Change
Private - Native	2,231,946	23.4	2,039,091	21.3	-2.0
Private - Total	6,660,475	69.7	6,660,475	69.7	0.0
Public - Native	2,592,347	27.1	2,535,192	26.5	-0.6
Public - Total	2,897,569	30.3	2,897,569	30.3	0.0
Grassland- Native	4,824,293	50.5	4,574,283	47.9	-2.6
Grassland - Total	9,558,044	100.0	9,558,044	100.0	0.0

A Public Lands versus Private Lands View: Parkland

Quick Facts

The loss of native is insignificant for both public (-0.3%) and private (-2%) lands.

The largest amount of native cover is held on private land (14%), public land native cover is 5.7%.

Most of the land is privately held (almost 90%).

Parkland NR	AAFCLU 1990	% in 1990	AAFCLU 2010	% in 2010	% Change
Private - Native	925,053	16.1	811,322	14.1	-2.0
Private - Total	5,134,267	89.5	5,134,267	89.5	0.0
Public - Native	347,241	6.1	327,437	5.7	-0.3
Public - Total	602,238	10.5	602,238	10.5	0.0
Parkland - Native	1,272,294	22.2	1,138,759	19.8	-2.3
Parkland - Total	5,737,005	100.0	5,737,005	100.0	0.0

Concluding Comments: Results

- The overall change from 1990 to 2010 at about 2-3% is insignificant (data error wise)at the Natural Region and Sub-Region Level; remaining native cover is 48% in the Grassland and 20% in the Parkland (GVI and AAFC LU)

- At the Ecodistrict level the data shows more variability with some districts showing losses of 5 - 8%, particularly in the Grassland.

- The greatest jurisdictional loss of native cover was observed on some the Indian Reservations highlighted by the 19% loss on the Blood reserve.

- Higher native cover losses were also observed in the counties adjacent to Calgary and Edmonton (around 5 to 8%)

- The Public vs Private data stratification is also statistically insignificant in terms of native cover loss (2-3%) with most of the loss occurring on deeded lands.

Concluding Comments: Data

- The AAFC Land Use data served as the most consistent Time 1 versus Time 2 comparative data; it is recommended that the 2020 version of the AAFC Land Use data be obtained to gain a consistent 30 year perspective on change and remaining native.

- The NPVI – GVI Time1-2 analysis, although within the data error margin, had a couple of issues; the NPVI seemed to underestimate native cover while generalizing GVI for use with NPVI induced some error (about 2%)

- The Timescan products were inconsistent, sometimes aligning well with the validating data sets (GVI and PLVI) and sometimes not. A further investigation of the classification process is suggested using the ABMI Photoplot data.

- The PFRA and AAFC Annual Crop inventories were also inconsistent with respect to the validating data sources (GVI and PLVI)