A photograph of a forest headwater stream bed. The ground is covered in a thick layer of brown, fibrous sediment, likely sawdust and wood chips, interspersed with numerous small, light-colored sticks and branches. In the foreground, a large, dark, cylindrical log lies horizontally. To its right, a large, flat, circular tree stump is visible. The background shows a steep, dark, forested hillside under a cloudy sky.

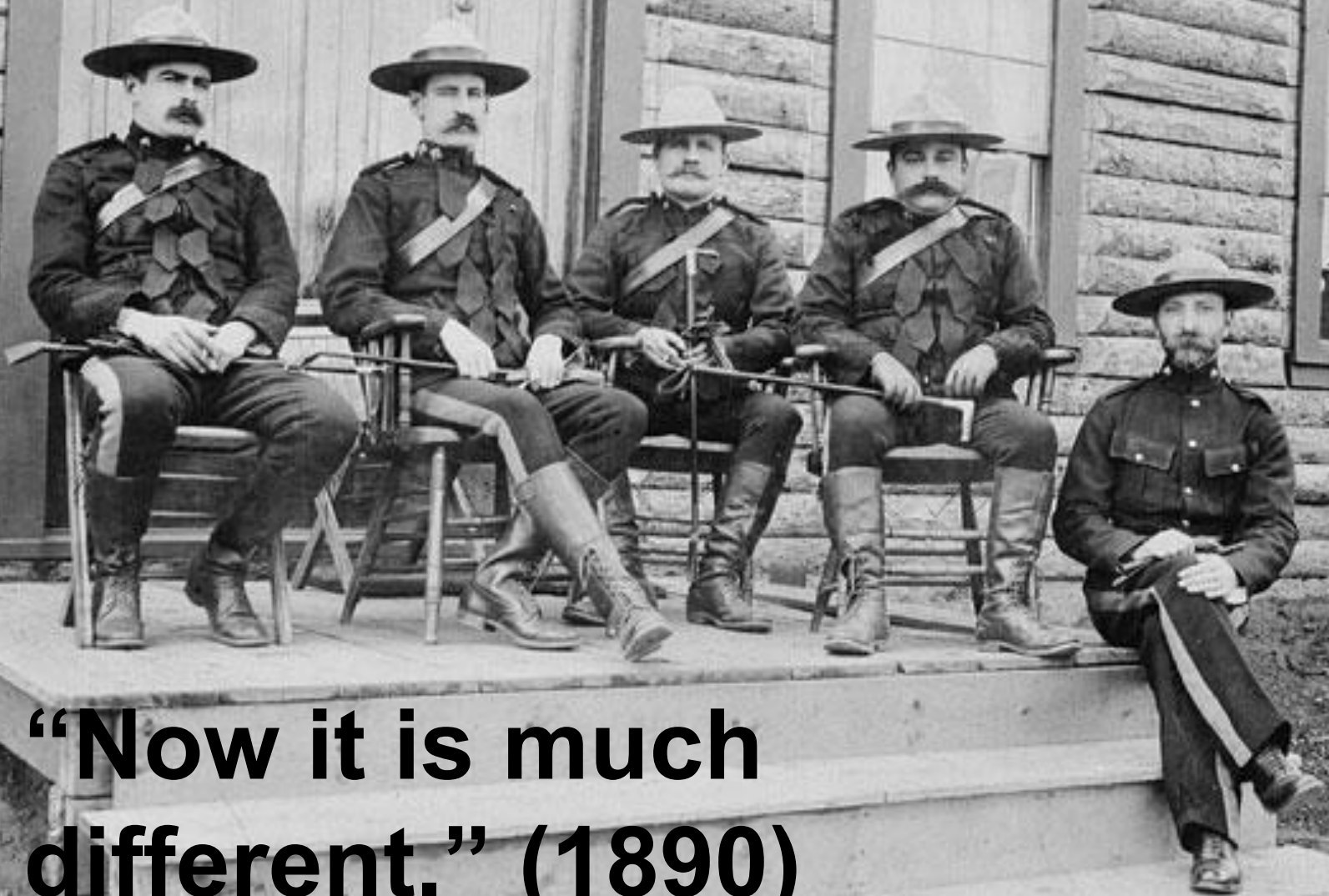
Stumps, Sawdust and Sediment: A legacy of logging in the headwaters?

Lorne Fitch, P. Biol.





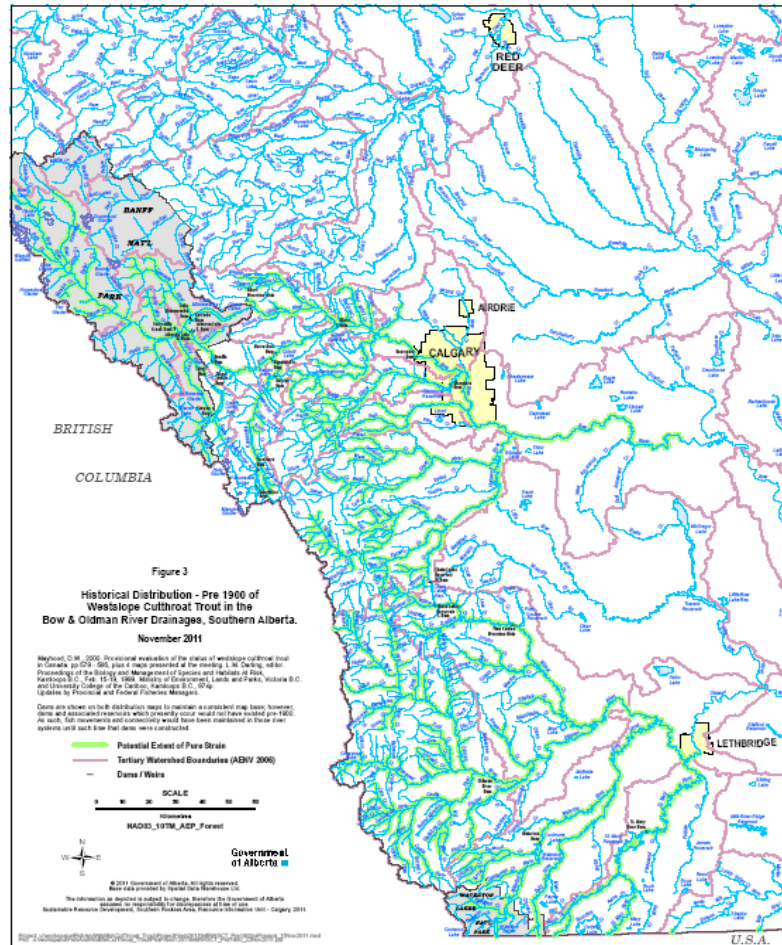
“When I fished first about 14 years ago, the rivers teemed with fish.”



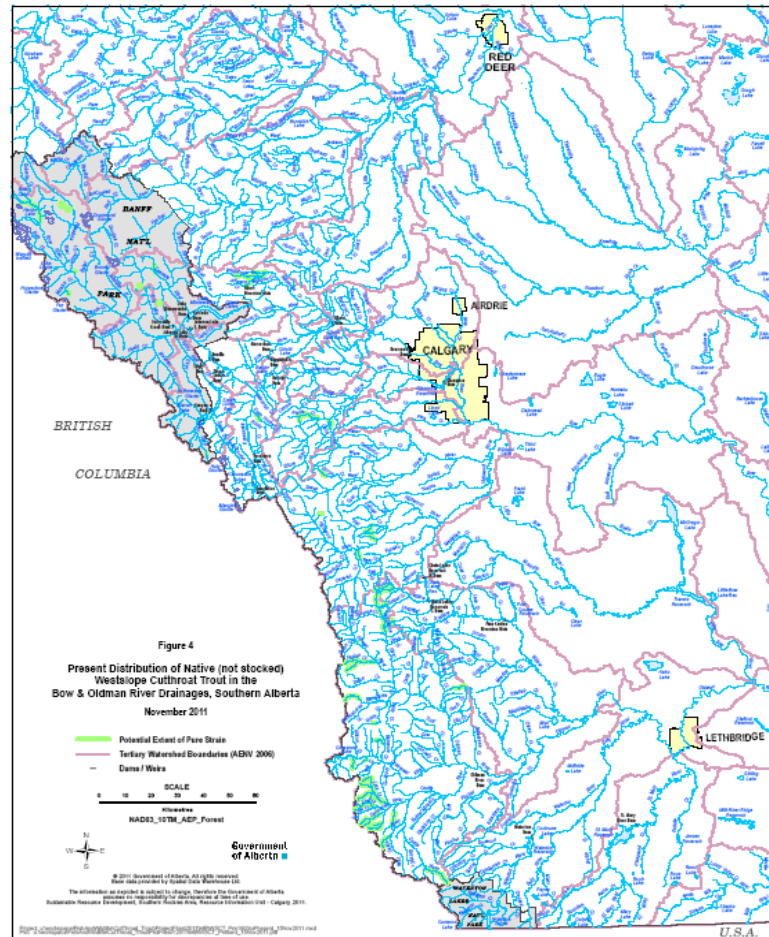
“Now it is much different.” (1890)

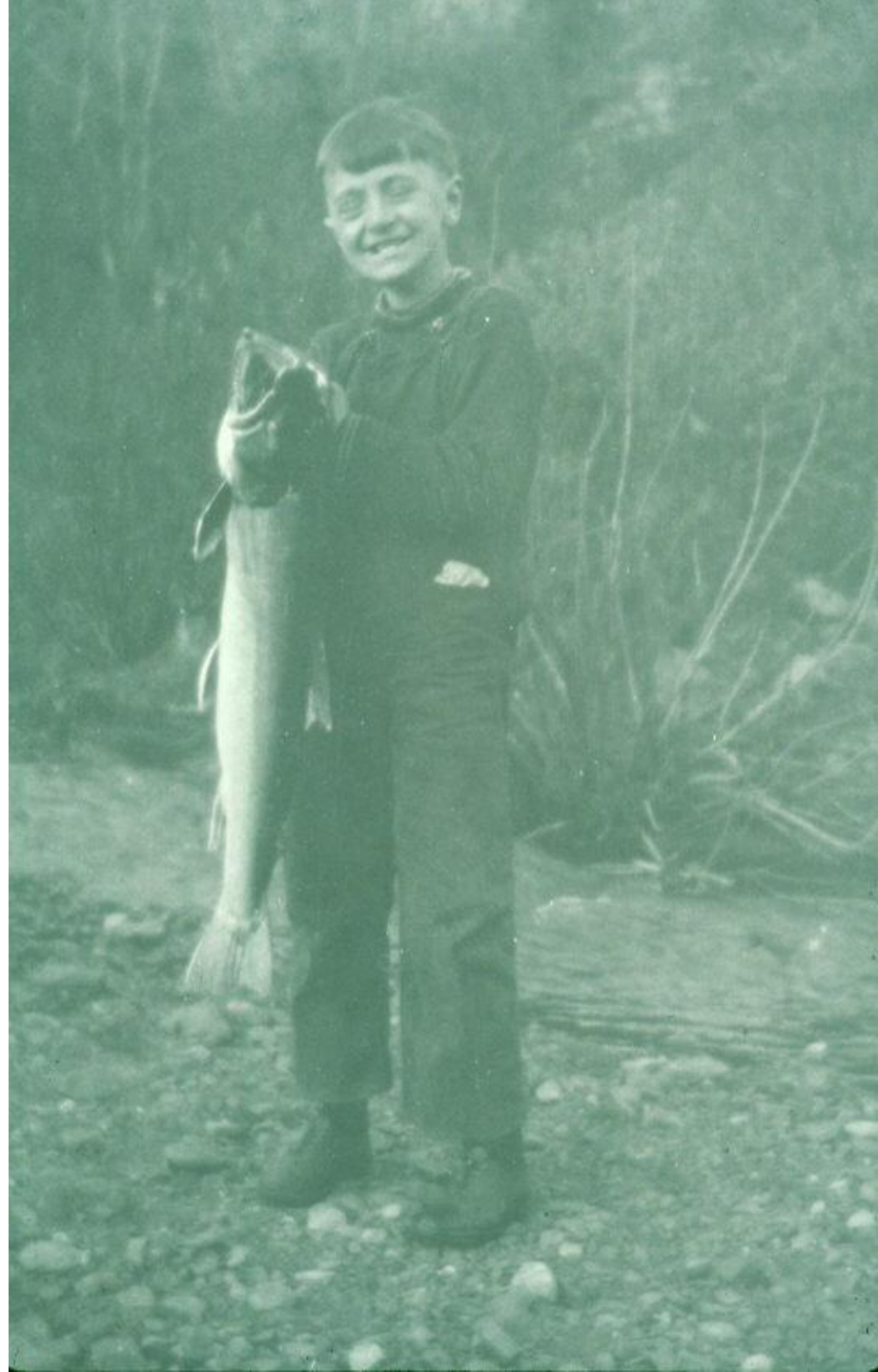


Historical distribution of Westslope cutthroat trout




Current distribution of Westslope cutthroat trout











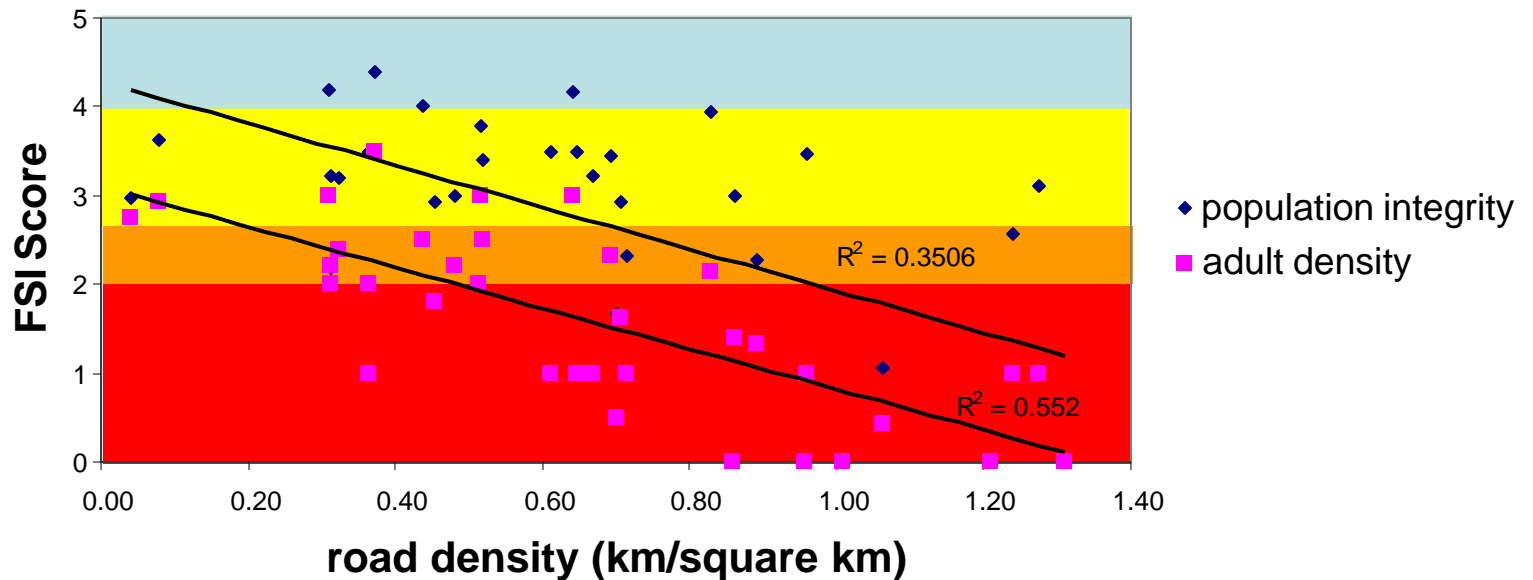
**In Memory of
Crowsnest
Bull trout
Pleistocene- 1965
Gone and forgotten**



E.g. bull trout population vs. just roads

Bull Trout FSI 2008 Population Metrics vs. Road density 2007

Tertiary Watershed Averages



Road Density (km/km²): Headwaters

Upper Carbondale River -	1.8
West Castle River-	1.6
Lower Castle River-	2.0
South Castle River-	0.7
Beavermines Creek-	2.0
Beaver Creek-	4.5
Ghost River-	5.1

Key Thresholds: 0.2- 0.5 km/km²

Stream Crossings (#/km²): Oldman Watershed

Racehorse Creek- 2- >4

Dutch Creek- 1- >4

Oldman River- 0.5- >4

1950- 177 crossings

2001- **2803** crossings

Gravity is a significant factor in watersheds











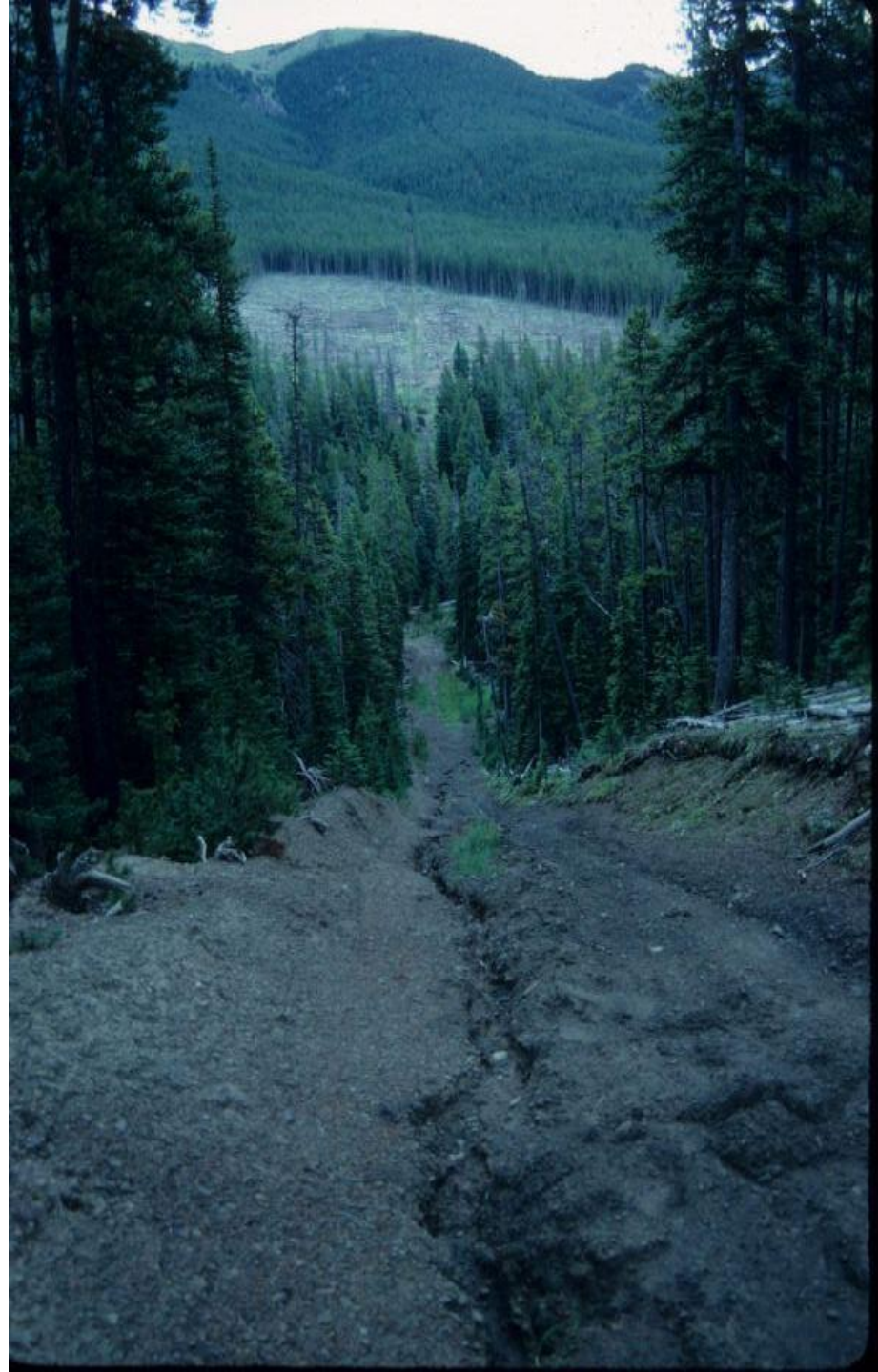












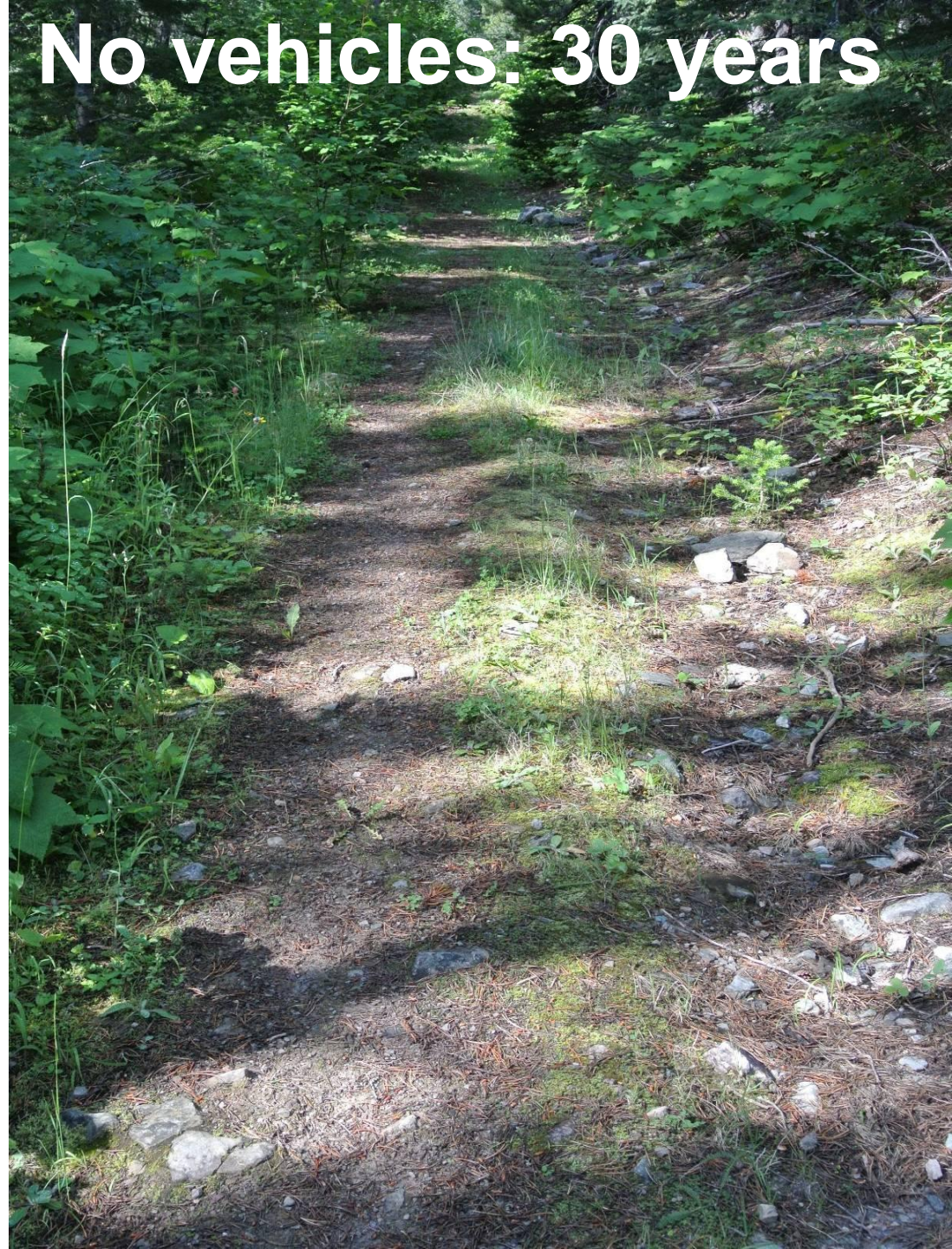








**No vehicles:
50 years**



No vehicles: 30 years



“...no silt has escaped from the roadway into the creek...” Alberta Forest Service









**“All erosion control measures
are in place...”**

Alberta Forest Service















**Upstream of
logging**



**Downstream of
logging**









Unlogged



Logged







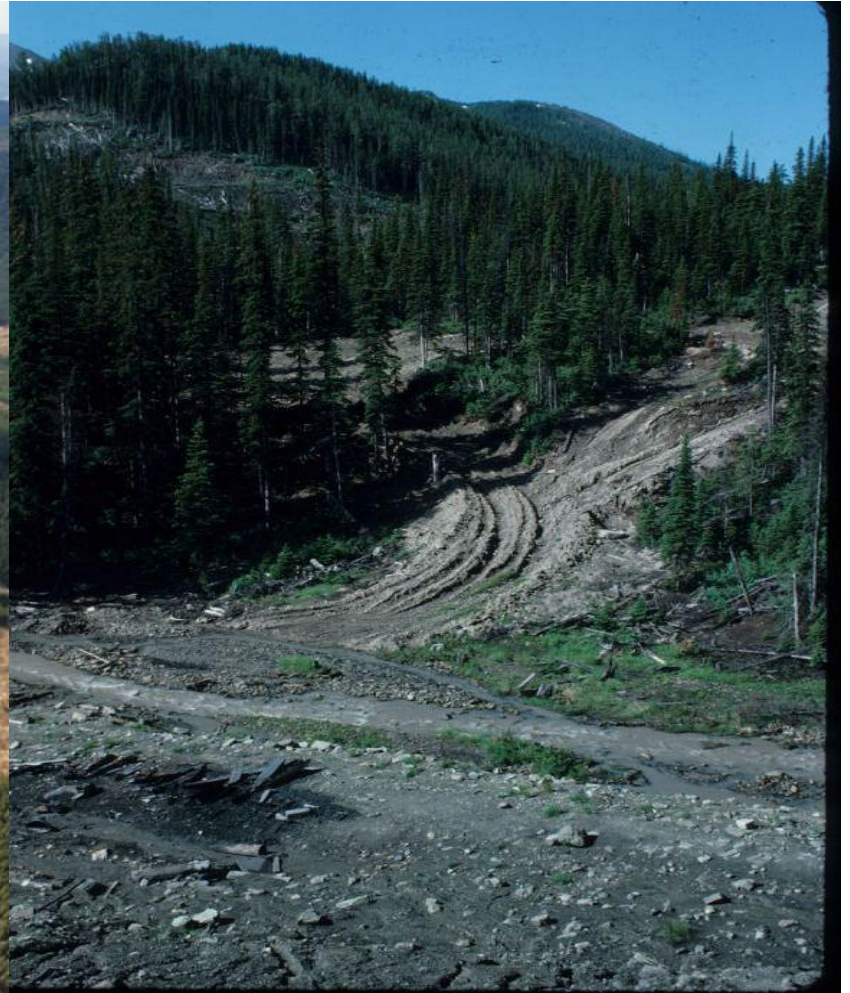
Where to go?

- Shift from sustained timber production to sustainable forest management



Where to go?

- Reduce the footprint



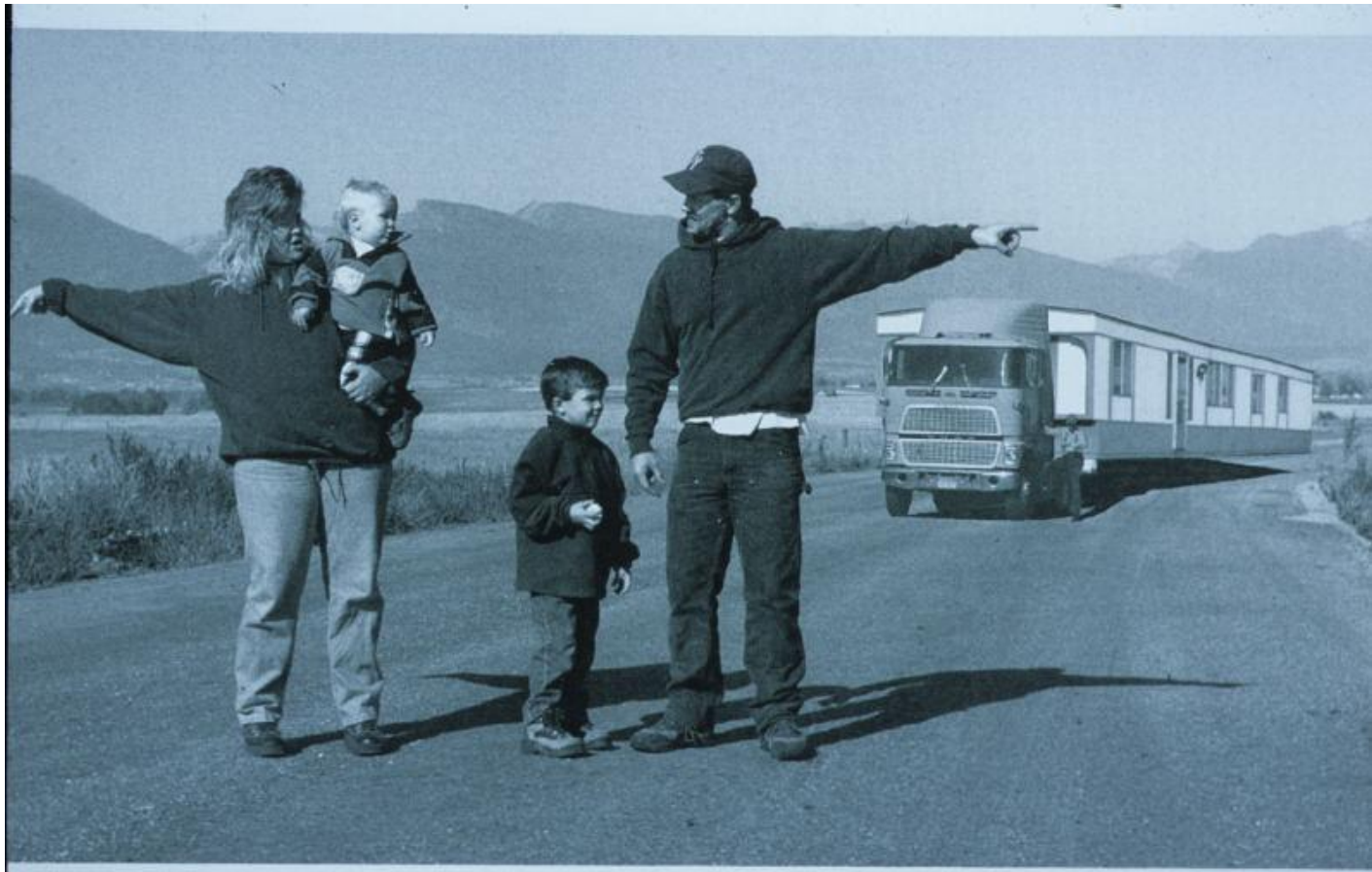
Where to go?

- Plan for, anticipate natural processes



Where to go?

- Engage in ecosystem-based planning



Land Use Planning in Montana

Where to go?

- Measure, Monitor, Adapt



Where to go?

- Measure success with broad metrics

