



Foothills Stream Crossing Program

AGM June 17, 2009



Foothills Stream Crossing Program

- Goals and objectives
- Progress to date
- Inspection protocol
- Watershed prioritization criteria
- Fish probability model
- Remediation plans for Pine and Nosehill Creek

Goal

- “...to help companies and crossing owners manage stream crossings in the long term...”



Objectives

- **Develop an industry-driven approach**
- **Establish a standardized stream crossing inspection process and protocols**
- **Establish a system to identify priorities for maintenance and replacement**
- **Improve the quality or performance of stream crossings**
- **Monitor results**



Current membership (crossing owners)

- ❑ **BP Canada**
- ❑ **CN (inactive)**
- ❑ **CNRL**
- ❑ **ConocoPhillips**
- ❑ **Devon**
- ❑ **Hinton Wood Products, West Fraser Mills**
- ❑ **Imperial Resources (Esso)**
- ❑ **Suncor Energy (including Petro Canada)**
- ❑ **Talisman Energy**
- ❑ **Shell Canada (including Duvernay)**



Current membership (support)

- ❑ **Fisheries and Ocean Canada**
- ❑ **ASRD Public Land and Forests**
- ❑ **ASRD Fish and Wildlife**
- ❑ **Alberta Environment**
- ❑ **Foothills Research Institute**
- ❑ **Alberta Chamber of Resources**
- ❑ **Alberta Conservation Association**
- ❑ **Alberta Transportation**



Overall Progress to Date

- **2005**– First official meeting; Developed and approved Stream Crossing Inspections Manual
- **2006**– Completed just over 300 field inspections
- **2007**– Developed a collaborative watershed management strategy for two basins to test cooperative remediation process
- **2008**– Inspected all crossings and collected baseline fisheries data in test basins



Inspection Protocol

FISH PASSAGE PARAMETERS

Hang height (0.01m)	Riffle Crest depth (0.01m)	Outlet drop (0.01m)	Effective depth of pool (0.01m)	Backwater in culvert (%)	Substrate in culvert (%)	Substrate Type	Culvert slope uniform?	Fish barrier present?

CULVERT PARAMETERS

Type	Culvert Material	Road surface material	Diameter (0.01m)	Length (m)	Height of fill over culvert (m)	Bankfull channel width (0.01m)	Bankfull channel depths (0.01m)			Armour	
										Inflow	Outflow

BRIDGE PARAMETERS

Type	Total deck length (m)	Deck Width (# of lanes)	Decking material	Decking pattern	Curb type	Road surface material	PERFORMANCE AND SAFETY			
							Blockage of opening (%)	Cause of blockage	Grader markers/Bridge reflectors	
Abutment type	Abutment functioning?	Wingwalls functioning?	Armour	Bankfull channel width (0.01m)	Bankfull channel depths (0.01m)	Bankfull width under bridge (0.01m)	Bridge signs	Structural problems		

EROSION AND SEDIMENTATION

1. Preliminary Inspection			3. Sediment Source Inspection				
Evidence of sedimentation?	Source of Sediment		Location	Length	Width	Veg. cover class	Remediation type
						R. Dwnstrm	
			R. Upstrm				
2. Ditch Inspection			L. Dwnstrm				
Location	Length	Drainage improvement type	L. Upstrm				
R. Dwnstrm			Above Inlet				
R. Upstrm			Above Outlet				
L. Dwnstrm							
L. Upstrm							
4. External Sediment Sources (road, bridge deck, etc.)							
			Rating:		Source/Action:		

FISH PASSAGE PARAMETERS

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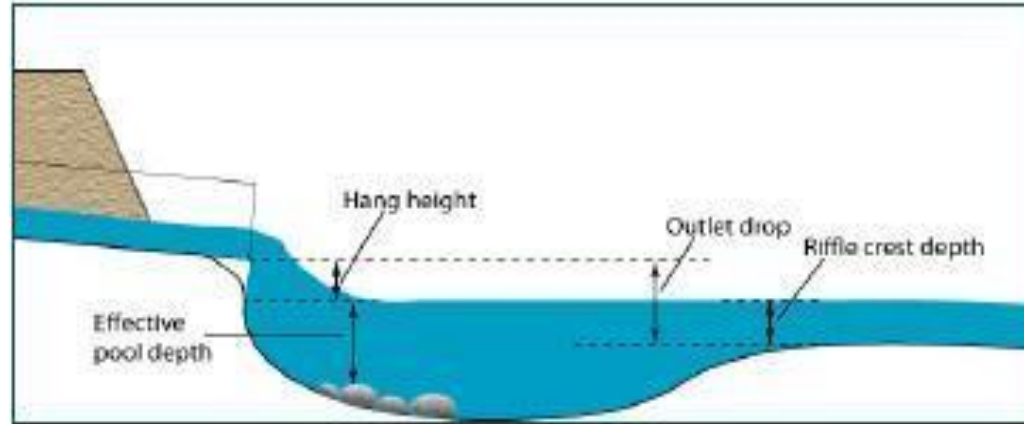
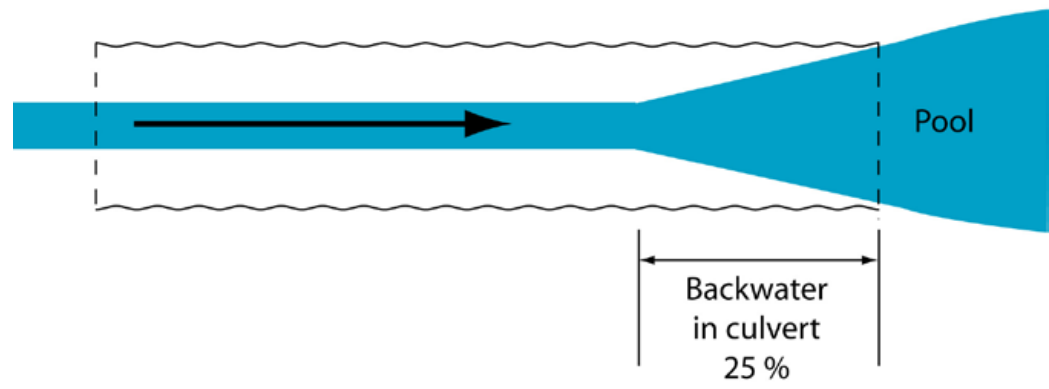


Figure 1. Measuring the hang height, effective pool depth and riffle crest depth

TOP VIEW



CULVERT PARAMETERS

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PERFORMANCE AND SAFETY

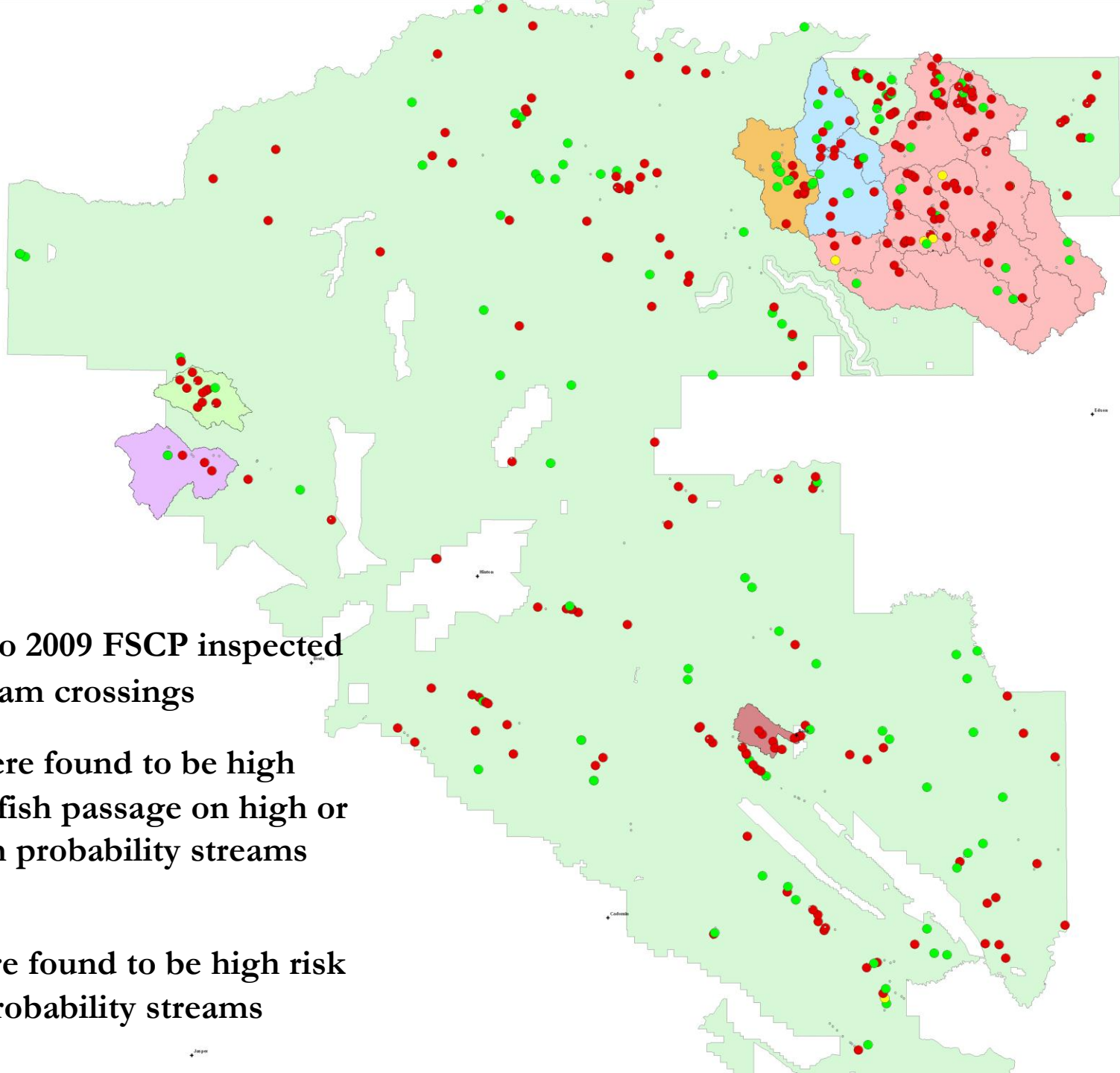
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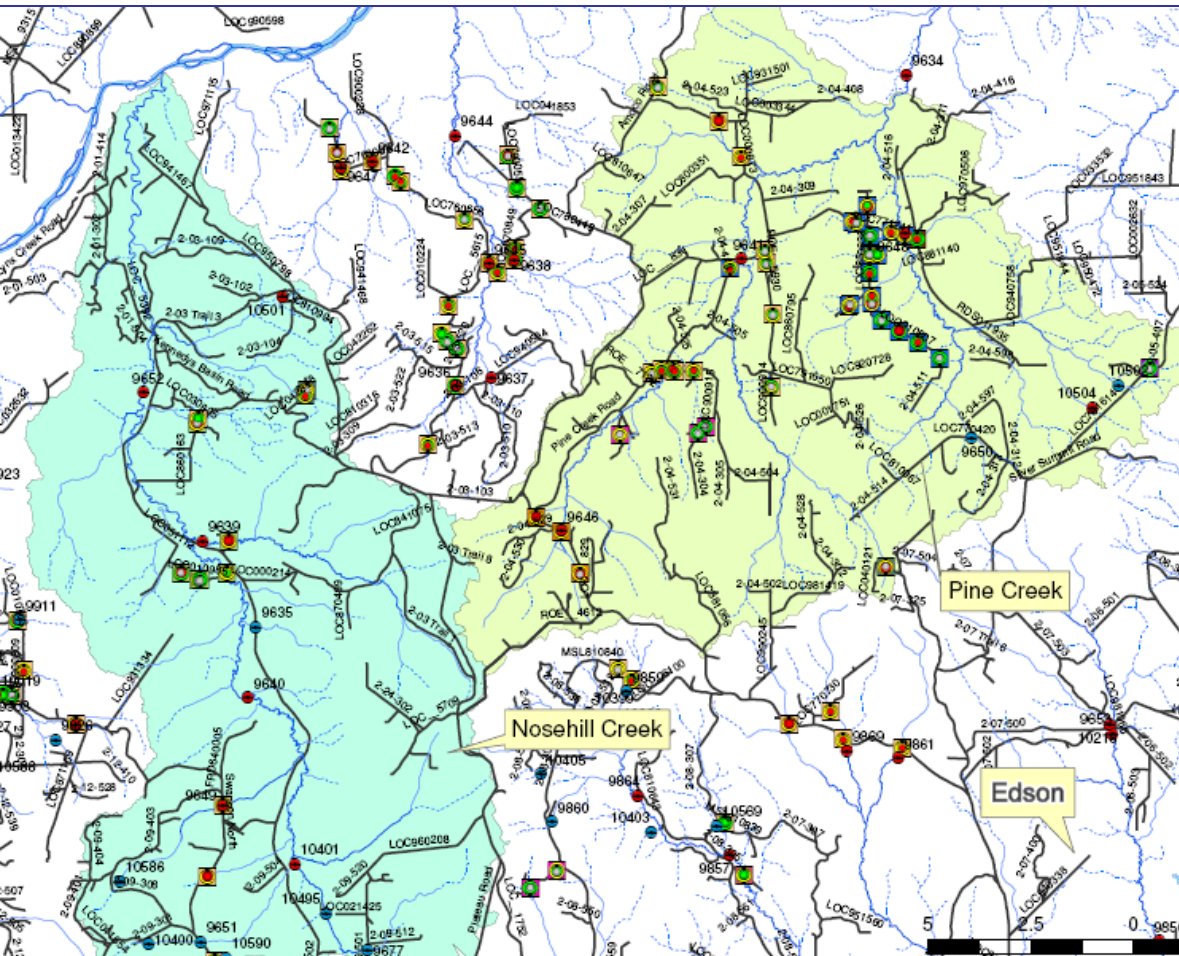


- 2006 to 2009 FSCP inspected 512 stream crossings

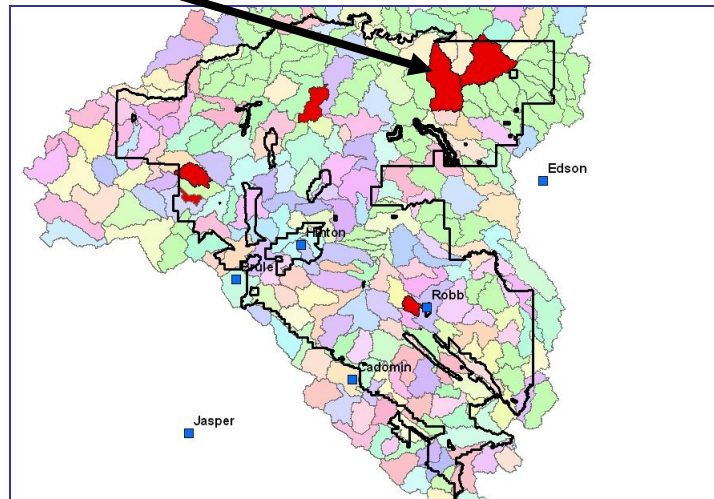
- 156 were found to be high risk for fish passage on high or medium probability streams (30%)

- 84 were found to be high risk on all probability streams (16%)

Nosehill and Pine Creek Watersheds



- 89 total crossings
- 84 crossings required sedimentation mitigation
- 17 crossings were barriers to fish passage
- ~50km of blocked fish habitat



***71% of crossings belong to FSCP member companies**

FSCP member progress to date and looking to the future

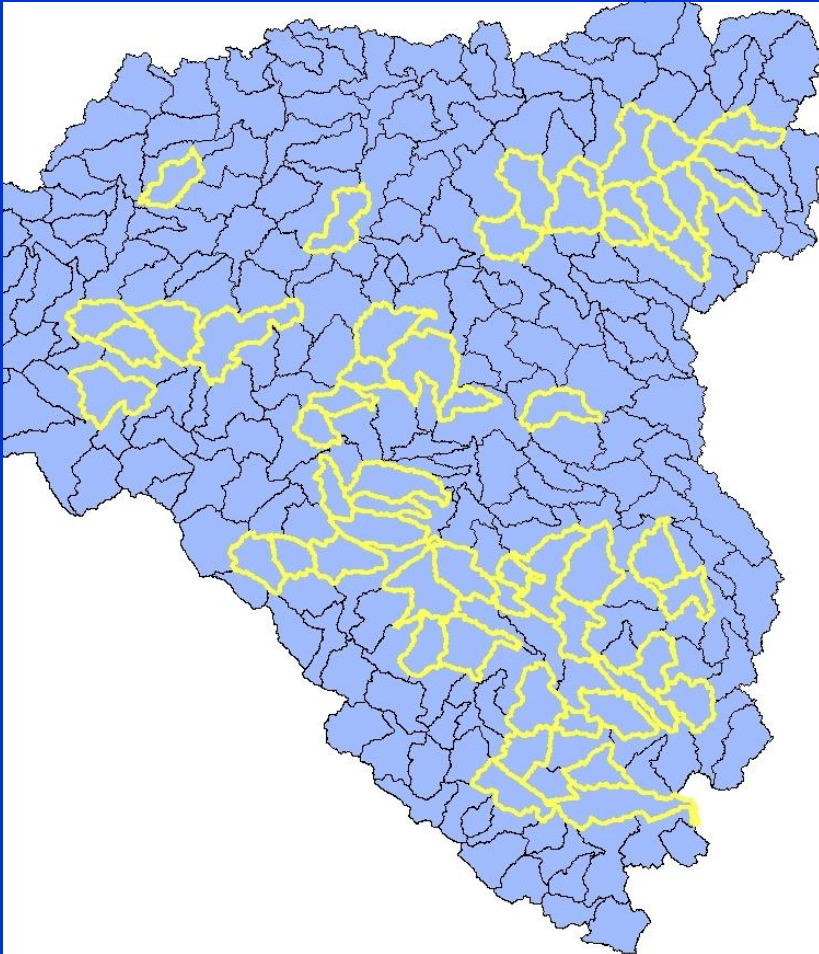
2009

- 47 (of 51) crossings had sedimentation issues addressed
- 5 crossings were mitigated for fish passage opening 29km of fish habitat opened (63% of recommended fish passage repairs)

2010

- Remaining 4 crossings at risk for sedimentation will be repaired
- Planned repair to remaining fish barriers will open 15km of fish habitat

Watershed Prioritization (Work in progress)

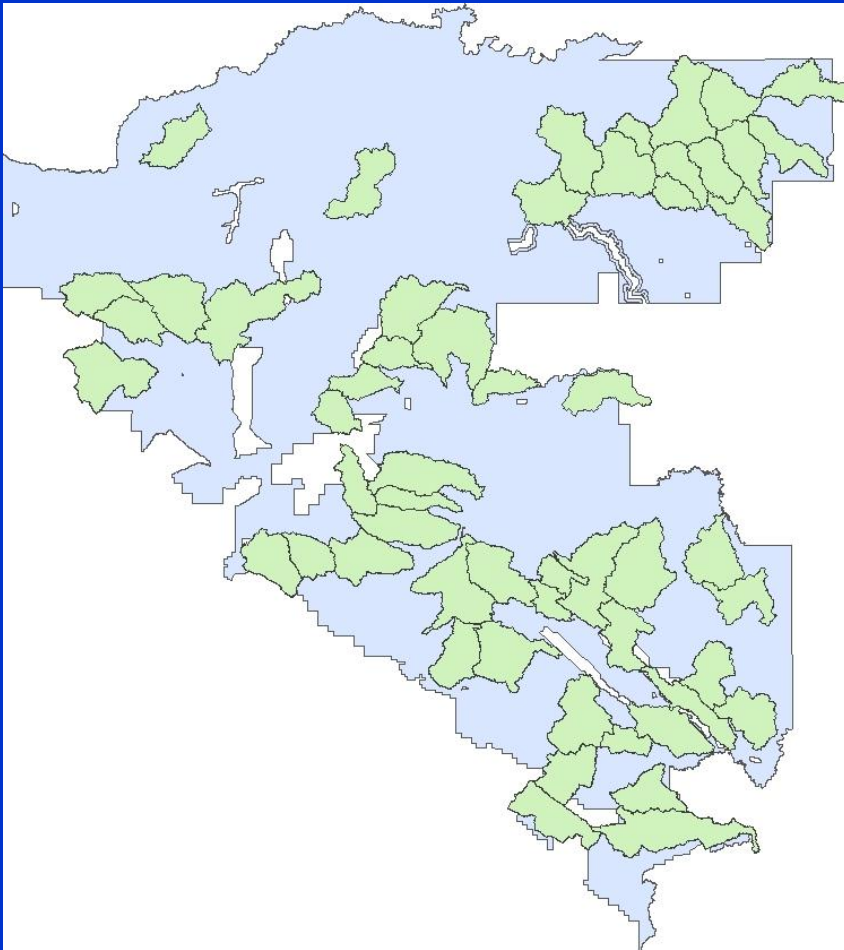


- 266 delineated watersheds

Next Step

- Select for watersheds with greater than 5km of blocked stream

Watershed Prioritization (Work in progress)

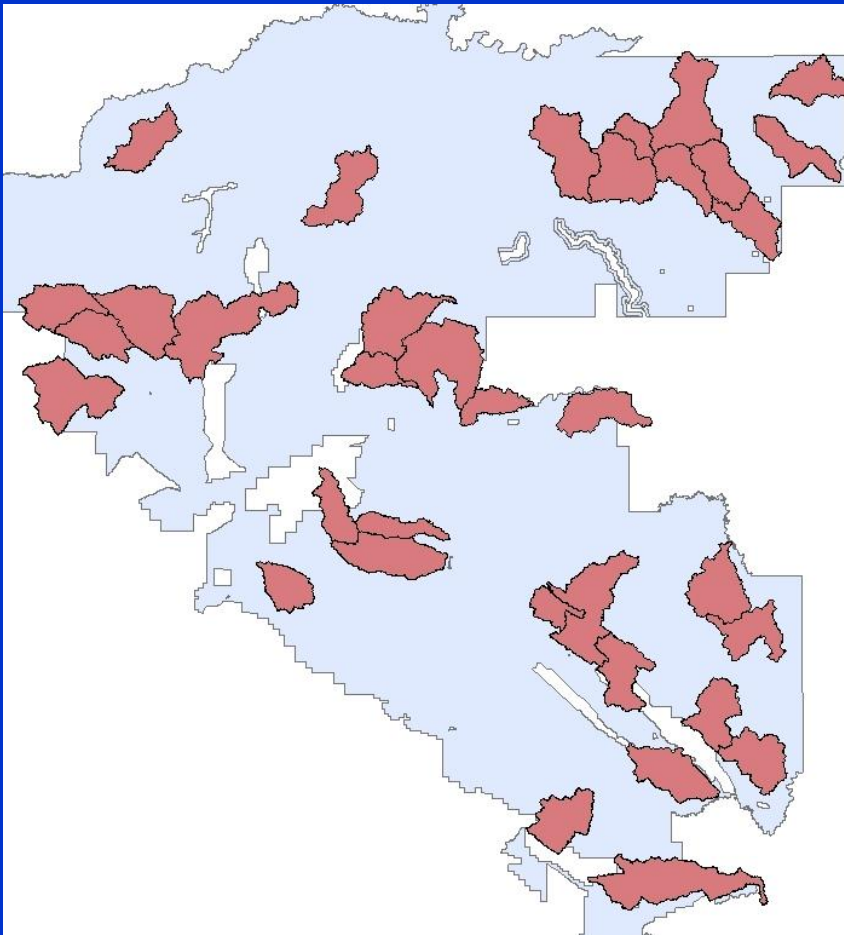


- 55 delineated watersheds
 - Greater than 5km blocked stream

Next Step

- Select for watersheds with greater than 1km of blocked *high probability fish habitat*

Watershed Prioritization (Work in progress)

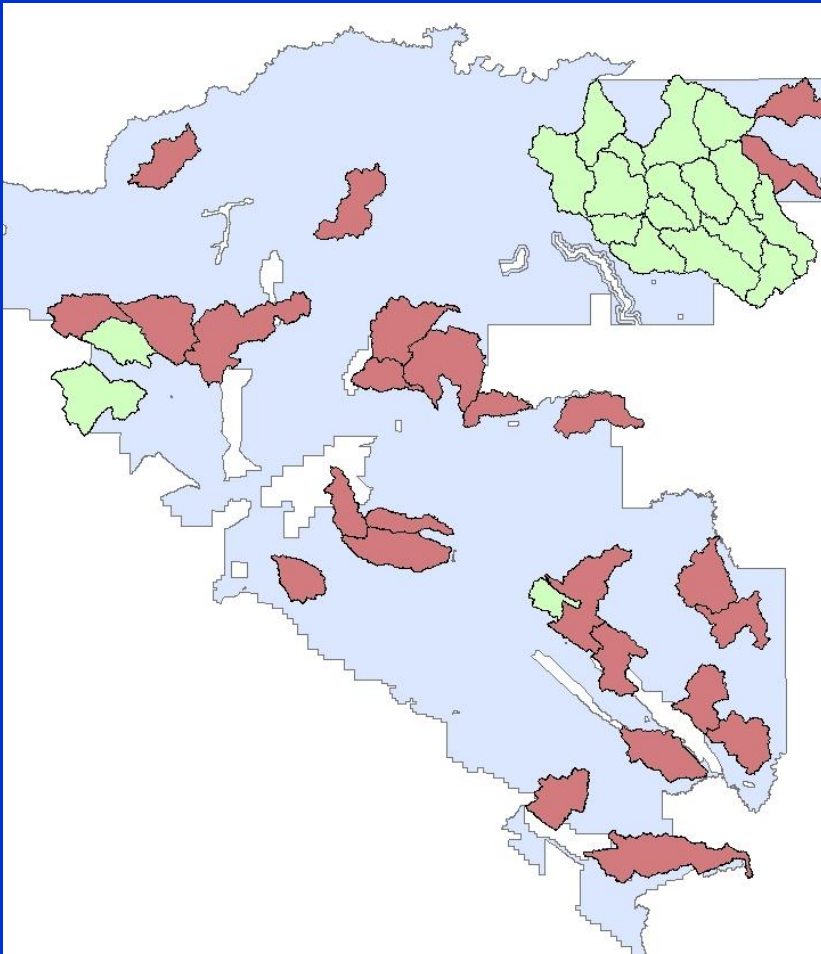


- 35 delineated watersheds
 - > 5km blocked
 - > 1km of blocked high probability fish habitat

Next Step?

- Select for fish species?
- Select for stakeholders?

Watershed Prioritization (Work in progress)



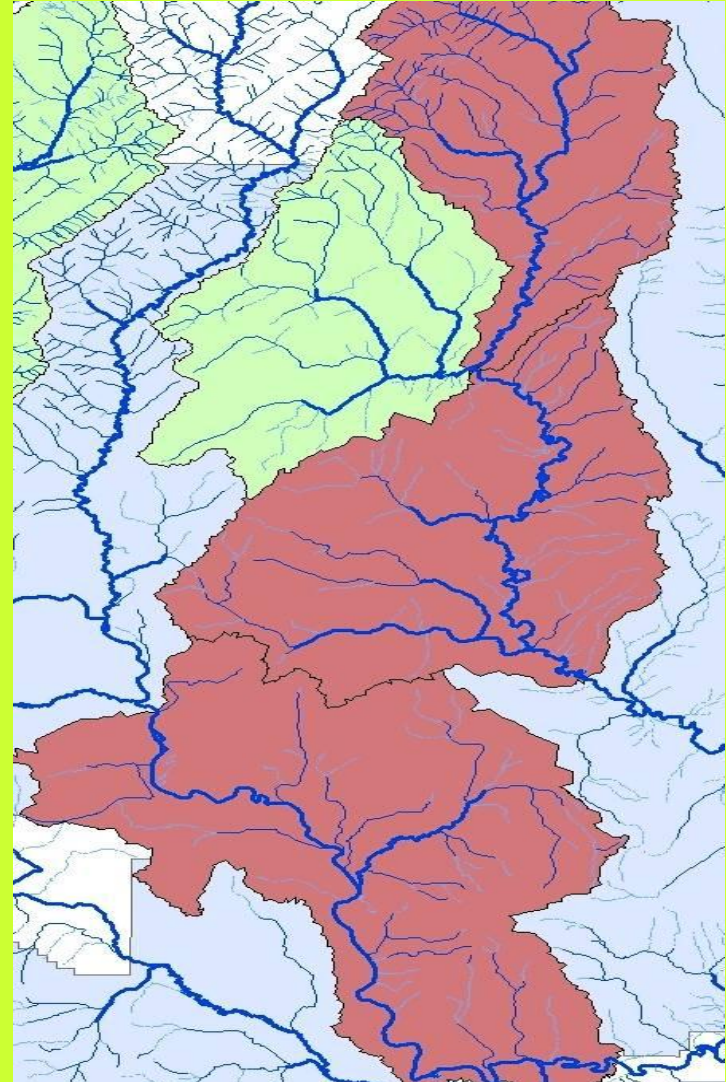
- 22 delineated watersheds
 - > 5km blocked
 - > 50km square area
 - > 1km blocked high probability habitat

Next Step?

- Select for fish species?
- Select for stakeholders?

Fish Probability Model

- Drainage area
- Basin slope
- Basin elevation
- Percent wetlands
- Reach elevation
- Reach slope



Fish Probability Model

Pros

- Prioritizes a huge number of crossings and watersheds
- Quick
- Easy to use
- Best available management tool

Cons

- Uses best available data but some gaps are present
- Only extends to FMA border
- Like all models, not 100% accurate

Remediation Plan Updates

- Updates from all but one company
- One non member company has provided updates
- 4 additional watershed plans are being developed
- Edson watershed will be a priority in 2010
- Significant improvements will be seen by summer 2012 in Pine and Nosehill watersheds.

Problems/Concerns?

- **How to get non-members on board, both industry and government?**
- **The magnitude of the problems including the number of crossings and the cost of remediation.**
- **The balance between industry driven solutions and being in compliance.**



Summary

- **Good example of “integration”**
- **Consistent with Water for Life Strategy**
- **Strong support and cooperation from industry, FRI, ASRD and DFO**
- **Results oriented and continuous improvement**
- **Potential to expand across Alberta**





Thank you

