

# Lower Clark Fork Watershed Advisory Group

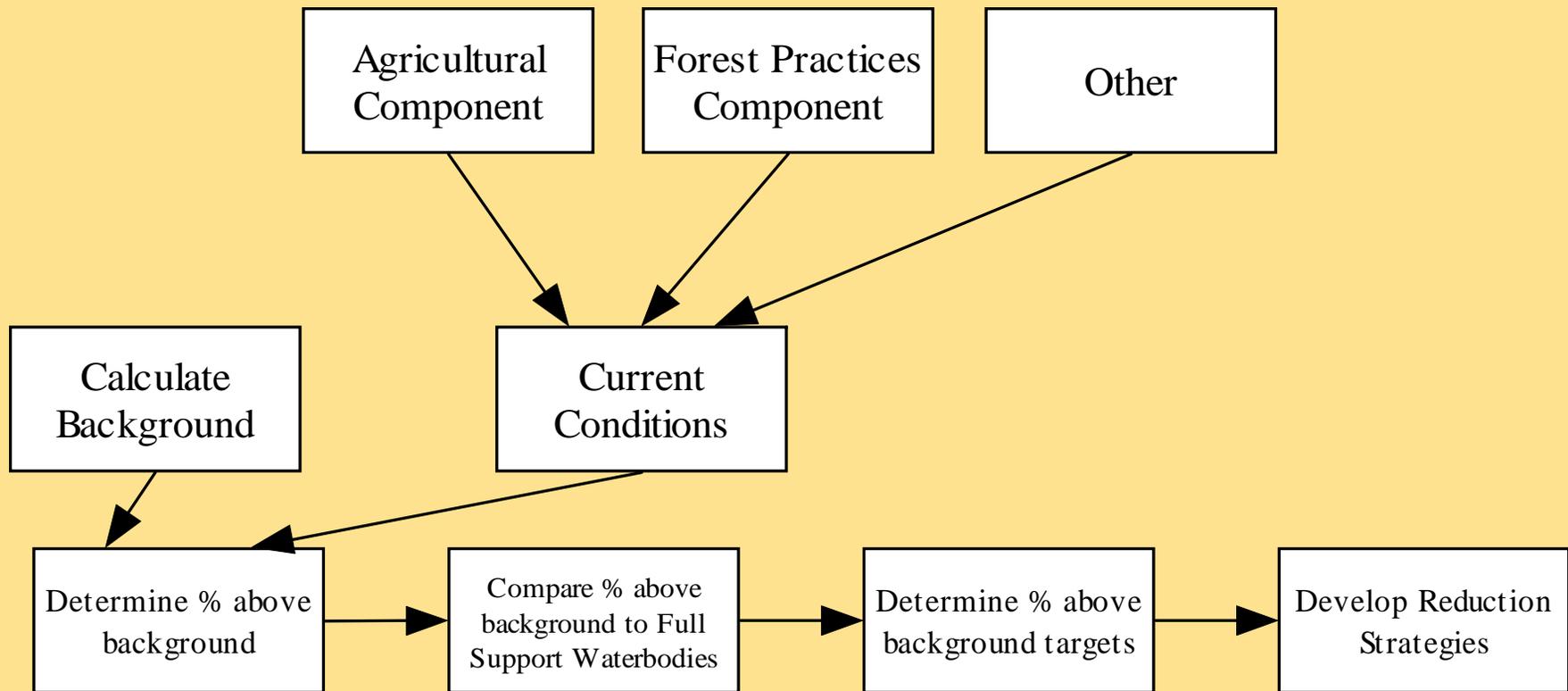
February 22, 2006



# Sediment TMDLs

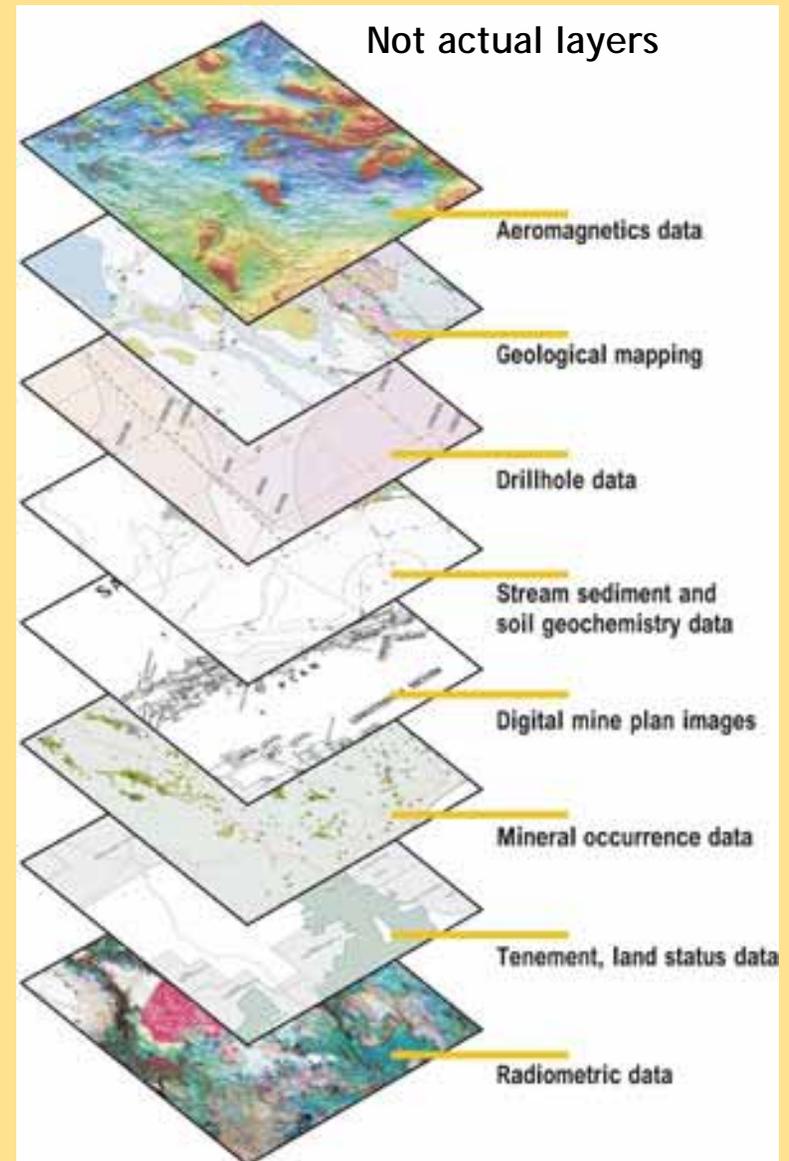
- Areas for Sediment TMDLs
  - Lightning Creek Drainage
  - Johnson Creek
  - Possibly Cascade – to be discussed later today
- Presentation Today
  - “Model” Concepts
  - Sediment Sources Included
  - Defining Targets
  - Possible reference areas/paired watersheds
  - Example of Model with Rattle Creek
  - Feedback on sediment sources included and timeframes

# % over background concept



# Sediment TMDL

- Account for sediment delivery from each land type category
  - Agriculture
  - Forest Practices
  - Roads
  - Mass wasting associated with forest practices/ roads and background
- Determining current conditions by evaluating percent greater than background



Area in each land type X coefficient of potential delivery to stream (tons/acre/year) = sediment delivery to stream

# Estimating Sediment Delivery to Streams

- Background
  - Forested landscape sediment production
  - Fire
  - Mass wasting delivery to streams not associated with a clearcut or road\*
- Anthropogenic
  - Clearcut/harvested areas
  - Mass wasting delivery to streams associated with clearcuts or roads\*
  - Roads
  - Stream Bank Erosion

\*Source Cacek, 1989 and IDL CWE Reports

# Defining Targets

Goal: When a watershed meets its sediment target, full support of beneficial uses should be achieved.

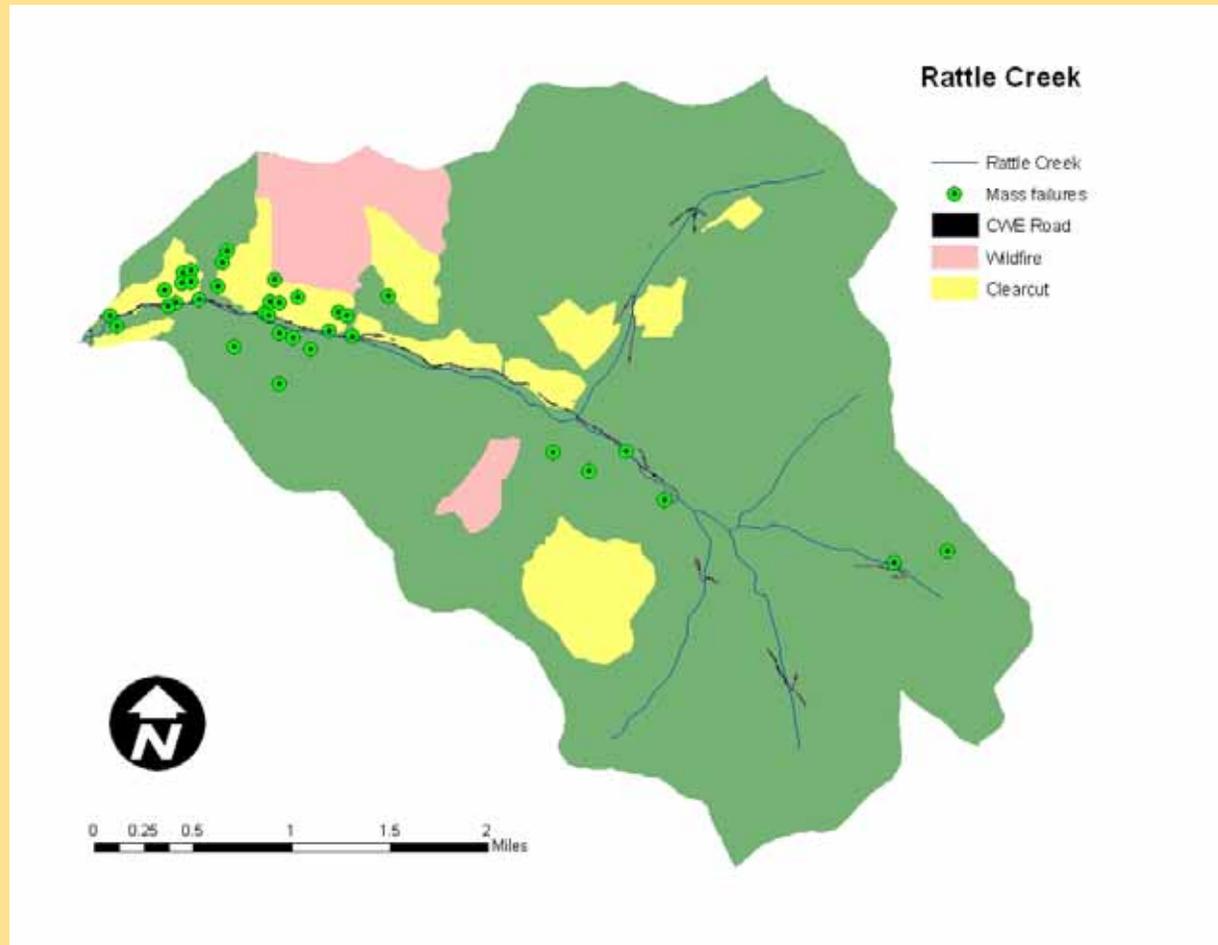
Method: Look at range of sediment loading throughout the basin and in reference watersheds considered to be stable versus those not meeting beneficial uses. Use paired watershed comparisons where possible.

Note: Consistently throughout the state it has been found that the threshold for full support watersheds is approximately 50% above background sediment levels.

# Reference Streams Identified

- Quartz Creek
- Savage Creek
- Upper Lightning Creek
- Morris Creek
- Other suggestions from the WAG?
- Paired watershed ideas?
  - E.g., Trestle and Lightning Creek

# Rattle Creek Example



## Preliminary sediment model results from Rattle Creek.

Land type	Area (acres)	Background/Anthropogenic	Sediment Generation
Forest Roads	28	Anthropogenic	235 t/a/y
Mass Failure	na	Anthropogenic	169 tons
Mass Failure	na	Background	38 tons
Wildfire	372	Background	12 t/a/y
Clearcut	693	Anthropogenic	21 t/a/y

Currently Rattle Creek is 186% above Natural Background conditions.

# Morris Creek

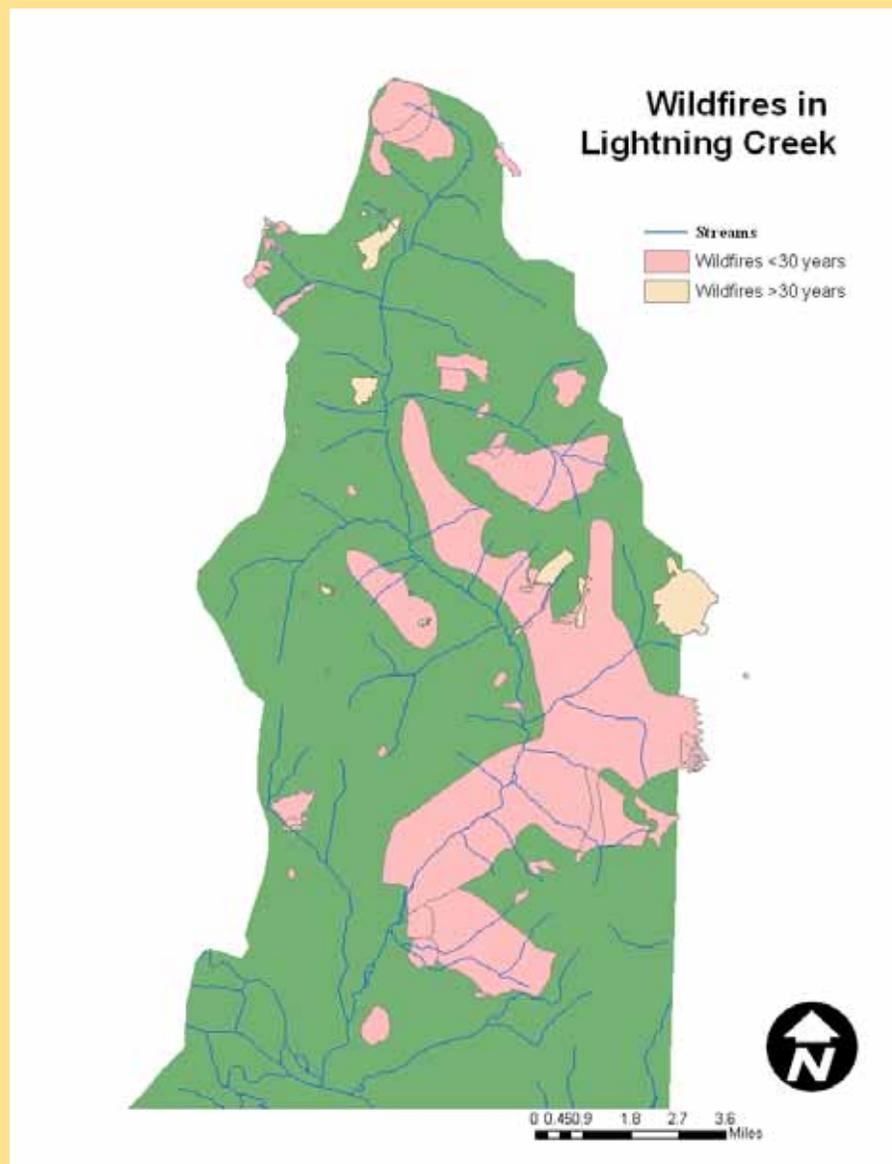
<b>Land type</b>	<b>Area (acres)</b>	<b>Background/Anthropogenic</b>	<b>Sediment Generation</b>
Forest Roads	15	Anthropogenic	7 t/a/y

Currently Morris Creek is 4% above Natural Background conditions.

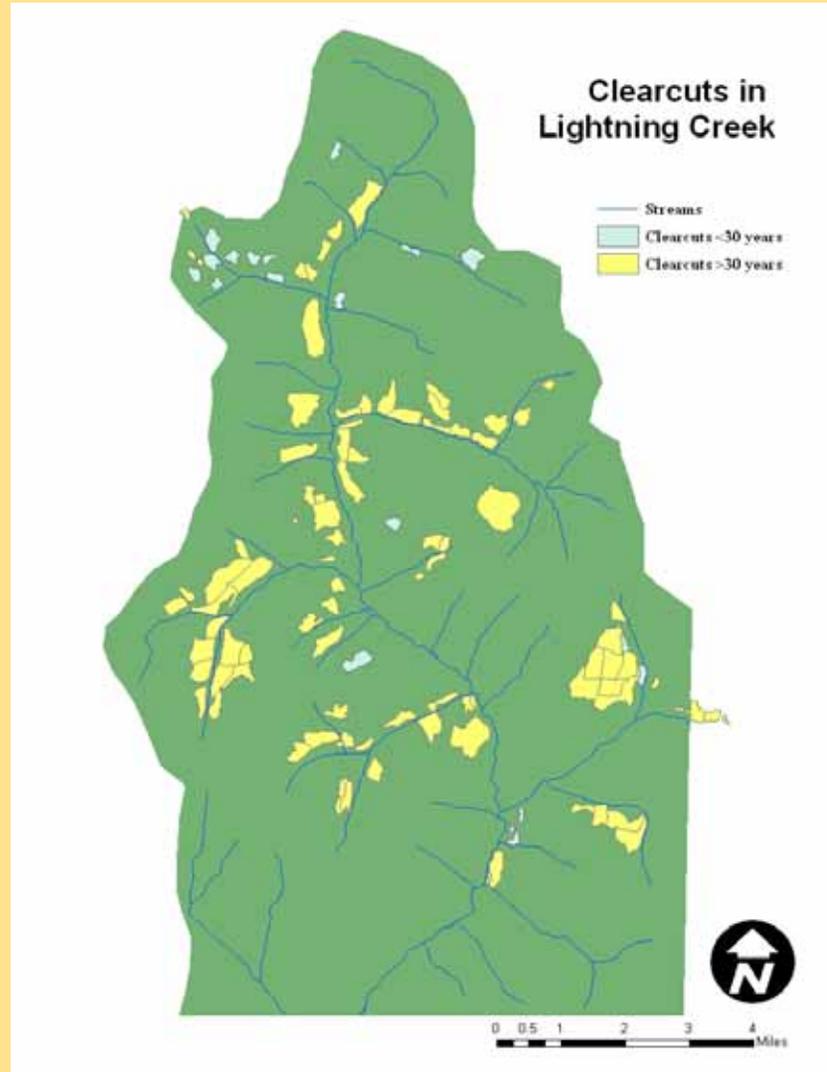
# Feedback: Model Parameters

- Wildfire
  - Assume increased sediment for 30-years
  - Alternative: Figure a percentage of each watershed burns each year based on fire return interval and that percentage has a higher sediment delivery potential
- Clearcuts
  - Assume increased sediment delivery for 30-years, slightly higher than wildfire input

# Wildfires by Age



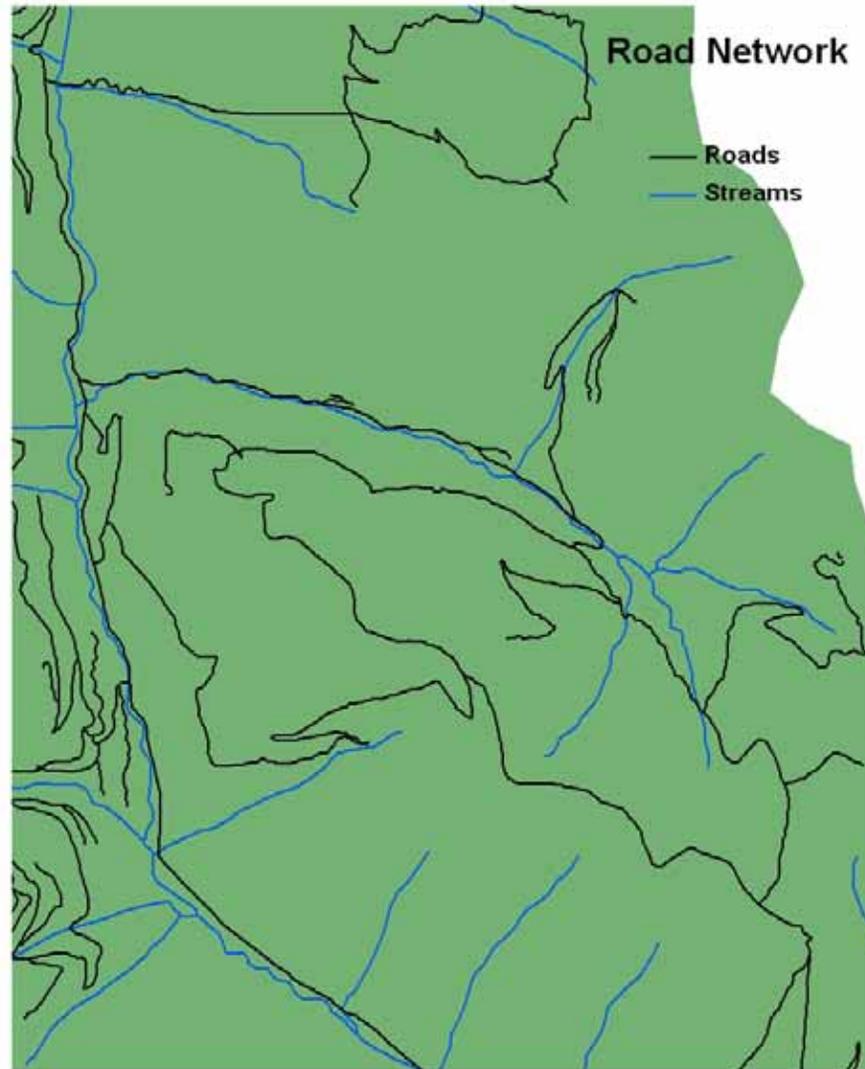
# Clearcuts by Age



# Feedback Model Parameters (cont)

- Landslides
  - Currently based only on known delivery from existing landslides
  - Does not account for large, chronic input nor does it account for rapid recovery
  - Only indirectly accounts for rain on snow zone risk by including existing landslides
  - Does not account for future landslide risk, except by assuming that as current landslide delivery diminishes, another landslide will contribute
  - Difficult to account for episodic nature
- Road Network
  - Currently use CWE scores for roads within 200 feet of streams
  - Entire road network may increase landslides in sensitive areas, or other hydrologic impacts, though assume greatest sediment impacts from within 200 feet of streams
  - See example

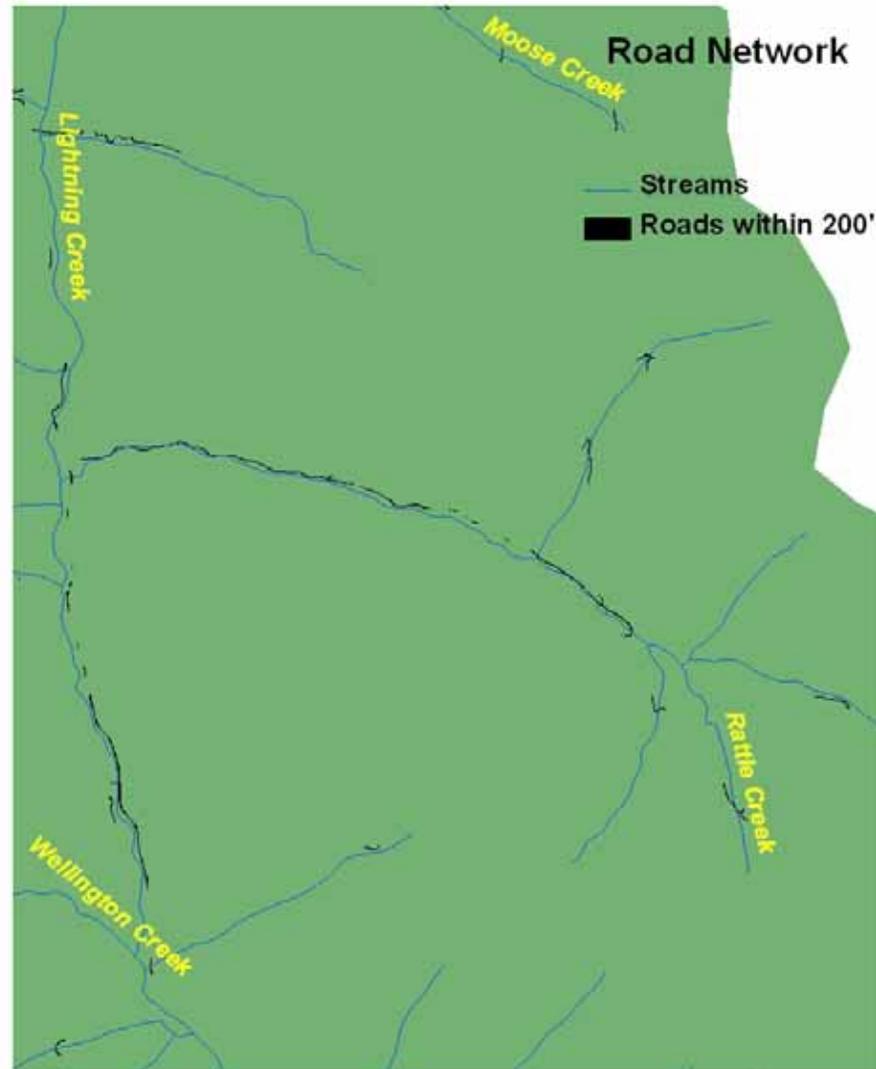
# Entire Road Network



0 0.25 0.5 0.75 1 Miles



# Road Segments within 200 feet



0 0.1503 0.6 0.9 1.2 Miles



# Next Steps: Sediment TMDL

1. Calculate sediment loads for all subwatersheds based on impacts discussed.
2. Complete distribution plot of current sediment levels and use to determine target (% above background).
3. Determine load reductions necessary to meet target by subwatershed.
4. Review these load reductions and target selection with the WAG

# Proposed Schedule

## Early April 2006:

- Review sediment model results and target
- Present Total Dissolved Gas strategy
- Complete draft of SBA and TMDLs and provide to WAG for review

## Late April 2006:

- Discussion of draft with comments on allocations from early April and sediment targets integrated into report
- Sediment allocations by ownership
- Develop approval process and public comment schedule with WAG

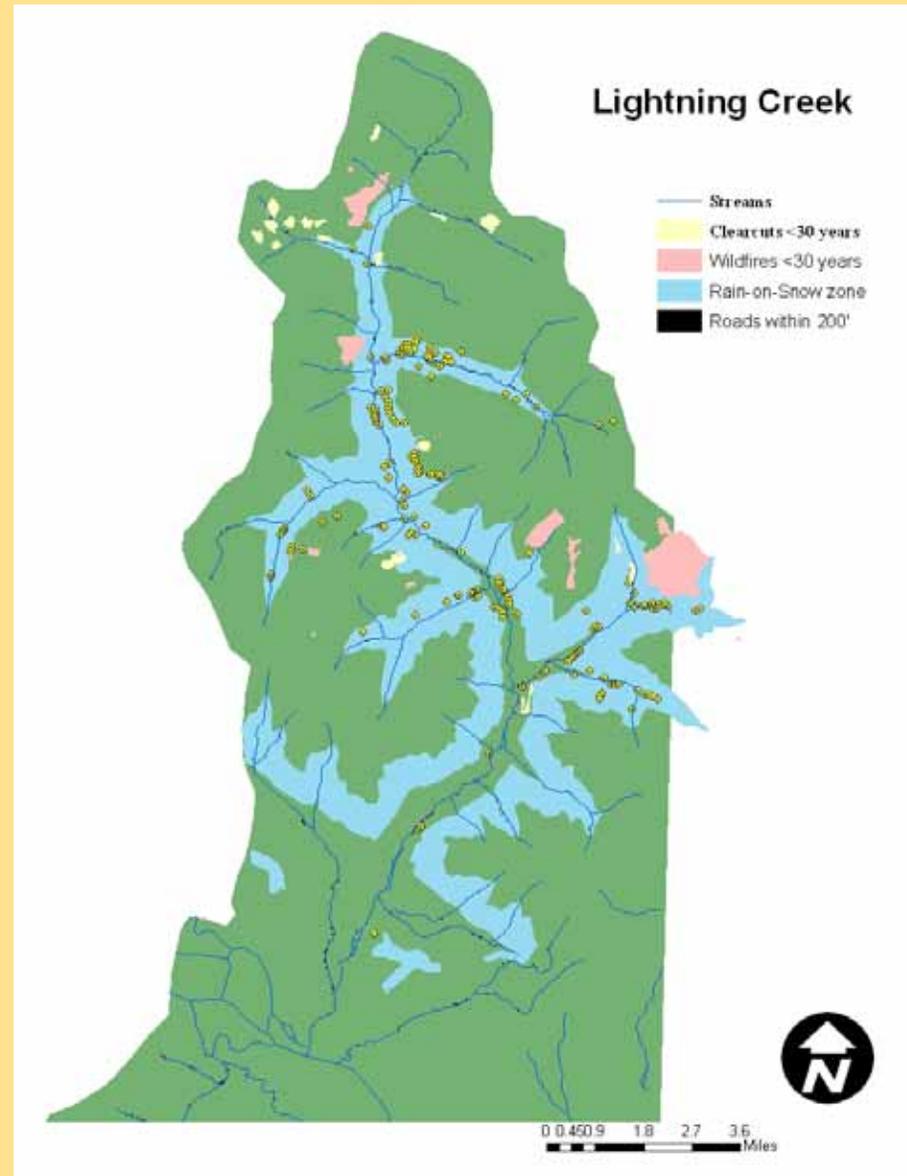
## When WAG is satisfied with draft:

- 30-day public comment period
- DEQ host public meetings to explain TMDL with WAG support

## Summer 2006:

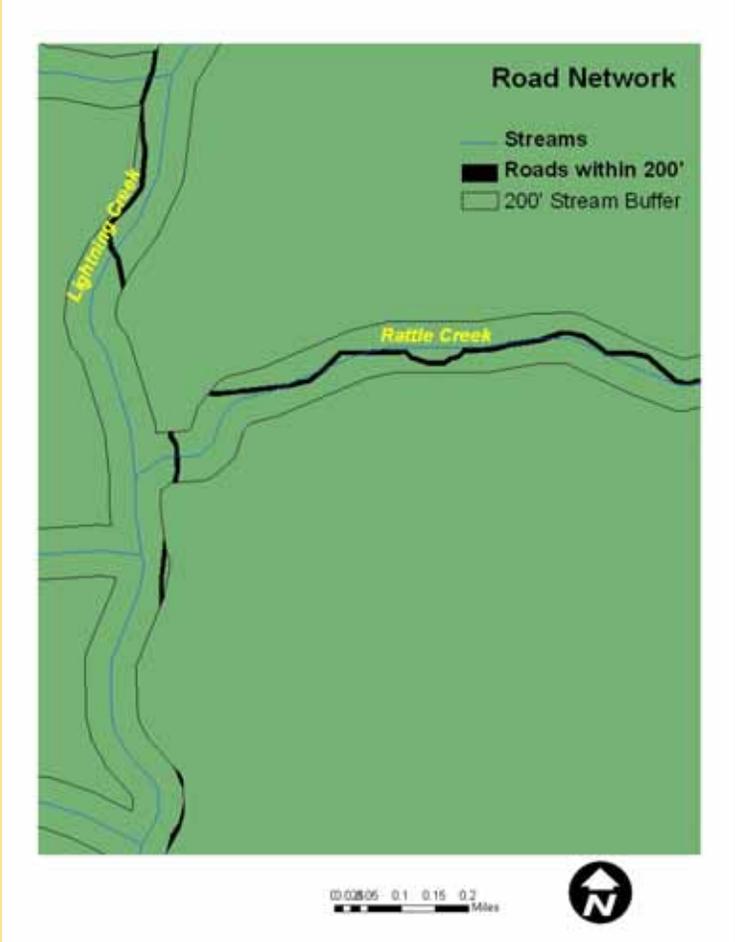
- Workshop(s) with WAG and public to draft implementation priorities to meet TMDL targets

# Modeled Sediment Parameters

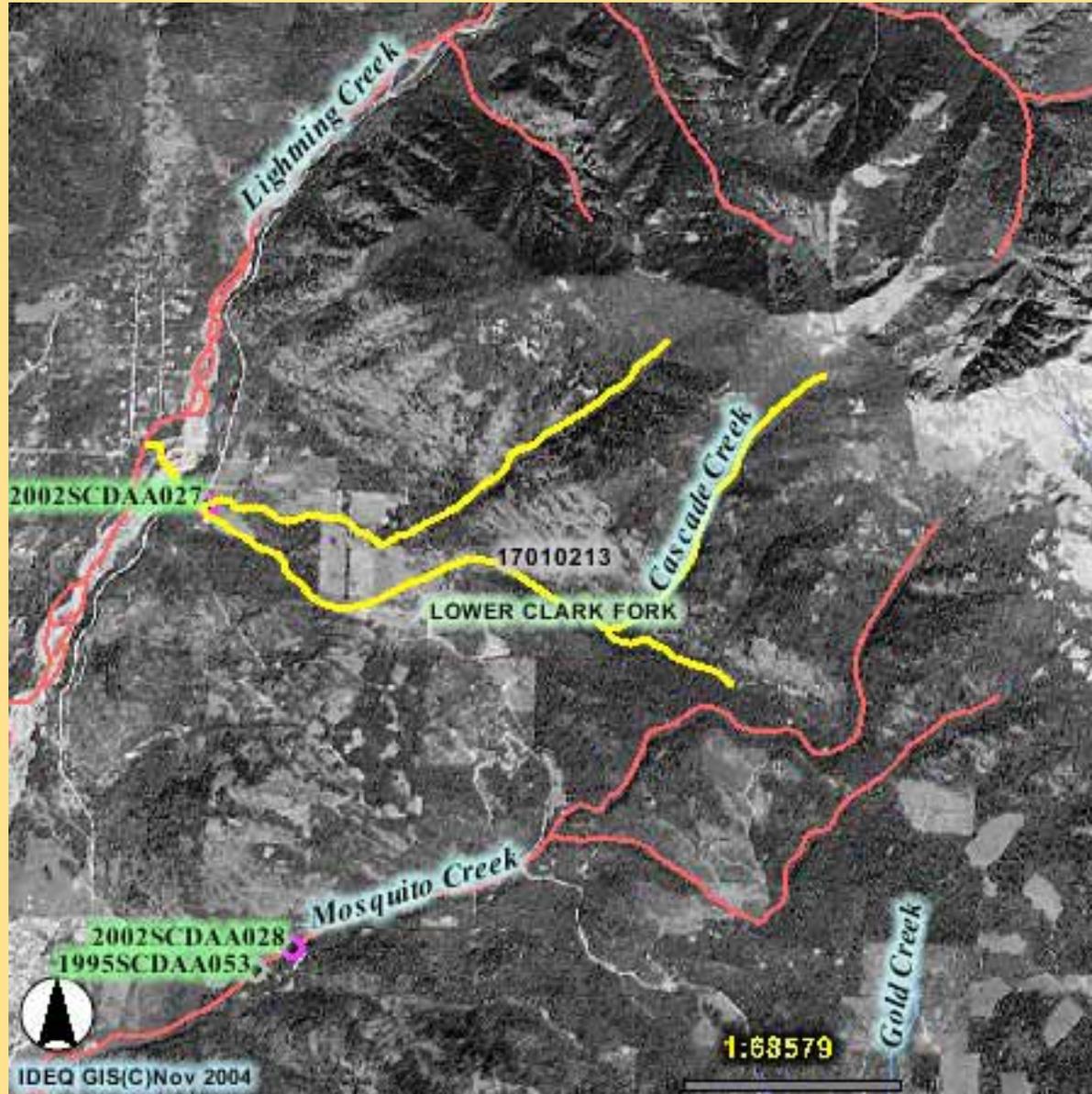


# Lightning Creek – Sediment sources





# Cascade Creek



# Cascade Creek

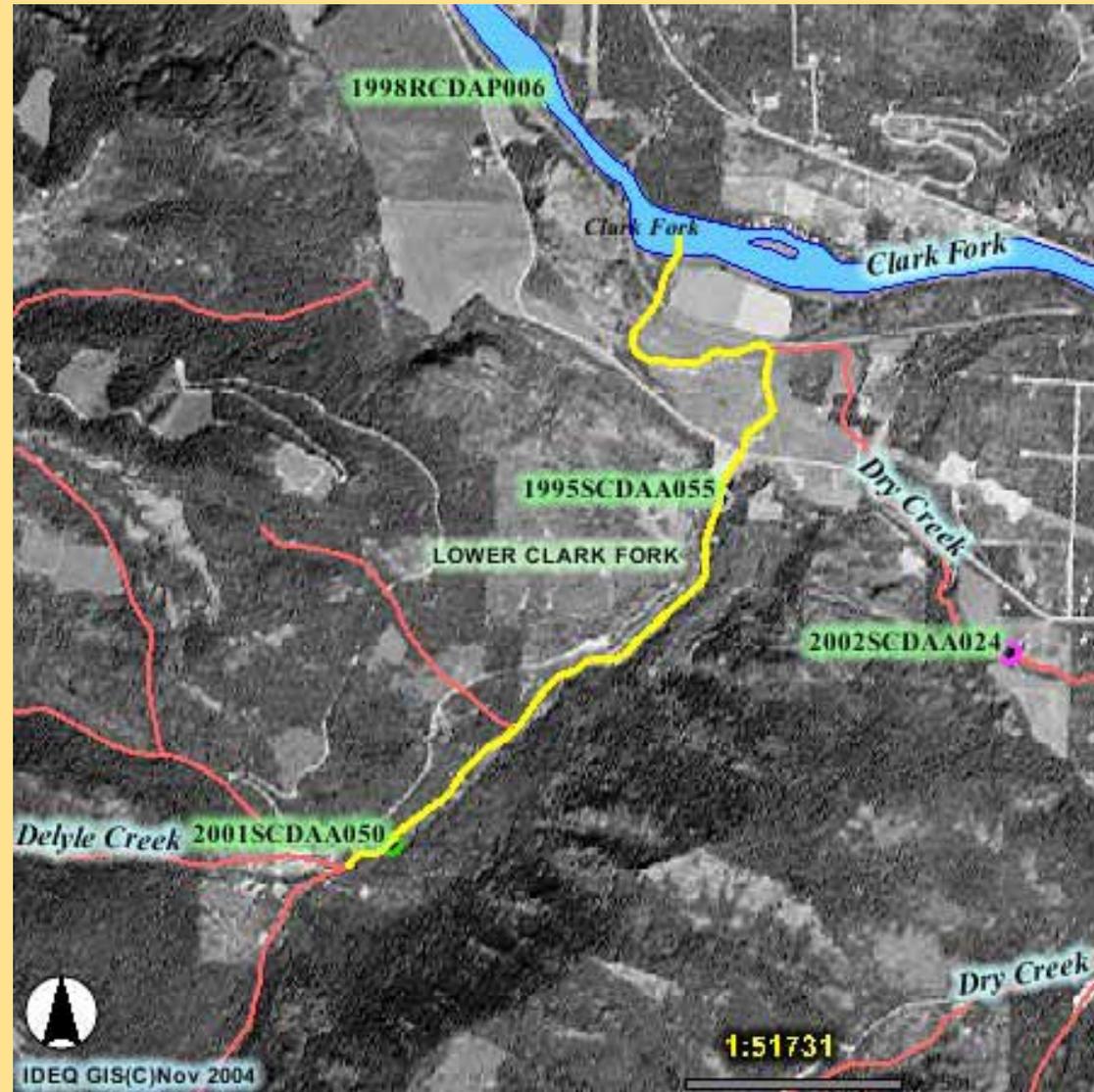
- Description: Mainstem of Cascade Creek to Lightning Creek, including first and second order portions
- Listing Basis: EPA added in 1998 for temperature
  - DEQ Temperature logger information 2000 upstream of culvert (May-Oct 2000) shows exceedences of Salmonid Spawning Criteria
  - Forest Service data available?
- BURP sites: 2002 about 820 ft (250 m) upstream from Road 419 crossing
  - Low Macroinvertebrate Score (1)
  - Low Fish Score (1)
  - Mid-range Habitat Score (2)
- Land Uses/Ownership: Forest Service (Headwaters), Private forest
  - CWE: Forestry practiced on 92% of acreage
- Pollutant Sources: Roads, bank erosion
- Recommended TMDLs
  - Temperature: potential natural vegetation method
  - Other Pollutants potentially causing low fish, macro invertebrate scores?
    - Fish barrier at culvert, high density of brook trout limit bull trout production (Bull Trout Problem Assessment, 1998)
    - ??? Other issues. Will go through stressor identification and present to WAG

# Cascade Creek



\*Photos taken 100 m above Cascade Creek Road crossing

# Twin Creek



# Twin Creek

## AU 004\_04

- Description: mainstem Twin Creek downstream of Delyle Creek
- Listing Basis: 1998 EPA addition for temperature.
  - IDFG temperature logger information shows temperature exceedence.
- BURP sites:
  - 2001 site at top of assessment unit reach: Full Support
    - Macro – 3; Fish - 2; Habitat – 3
  - 1995 site at lower end of assessment unit: Not Full Support
    - Macro -1; Fish – 2; Habitat - 1
- Land Uses/Ownership: Private, agriculture/livestock grazing, timber harvest
- Pollutant Sources: Channel modification (note restoration project to re-meander Twin Creek completed in 2001); agriculture/livestock grazing; roads; bedload movement deposit in 1997; timber harvest
- Recommended TMDLs
  - Temperature: potential natural vegetation method