

## Meeting Water Quality Goals in North Fork CDA Subbasin Streams?

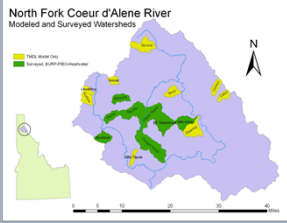
North Fork CDA Subbasin Watershed Advisory Group Meeting

October 20, 2011

## Acknowledgements

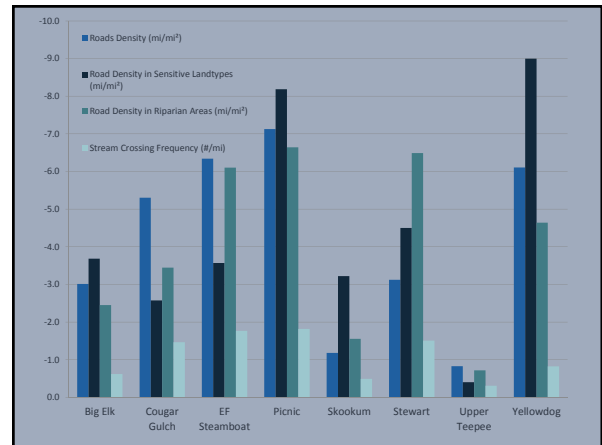
- Ed Lider (USFS Retired)
- EPA: Don Martin, Leigh Woodruff, Eric Monschein
- DEQ: Tom Herron, Bob Steed, Tyson Clyne, Kristin Keith, Marti Bridges, Jason Pappani, Kajsa Stromberg
- USFS: Chris James, Dave Funk, Tom Burke, Lisa Dosch, Eric Archer, Brett Roper and PIBO program staff
- North Fork Coeur d'Alene River Watershed Advisory Group (WAG)

## Phase 1: Modeling



Reproduced sediment TMDL model in 19 watersheds with:


- 50 to 80 percent of headwater roads decommissioned
- Many riparian roads removed
- In-stream restoration conducted



## Phase 1 Modeling Results

Watershed	Sediment Delivery (tons/year)		Change (%)	Natural Background (tons)	1.5 Times Background (tons)	Likely Meets TMDL?	2007 Factor Above Background
	1986	2007					
Big Elk Cr	437.64	315.47	-27.92%	170.79	256.19	No	1.85
Brett Cr	145.90	80.52	-44.81%	77.17	115.76	Yes	1.04
Cabin Cr	107.53	95.04	-11.61%	56.73	85.09	No	1.68
Clinton Cr	133.13	72.88	-45.25%	66.38	99.57	Yes	1.10
Cougar Gulch	929.64	460.95	-50.41%	284.71	427.07	No	1.62
Downey Cr	398.91	209.42	-47.50%	140.48	210.71	Yes	1.49
East Fork Cougar Gulch	72.01	33.77	-53.11%	27.88	41.82	Yes	1.21
East Fork Steamboat Cr	595.03	341.55	-42.62%	161.71	242.56	No	2.11
Goose Cr	94.61	63.84	-32.66%	47.40	71.09	Yes	1.35
Hudlow Cr	202.25	181.81	-10.11%	79.91	119.87	No	2.28
Lewelling Cr	60.72	59.99	-1.19%	30.88	46.47	No	1.94
Little Teepee Cr	70.94	54.05	-23.80%	39.66	59.50	Yes	1.36
Picnic Cr	202.69	106.90	-47.31%	75.57	113.36	Yes	1.41
Skookum Cr	257.04	221.25	-13.91%	91.42	137.13	No	2.42
Spruce Cr	248.31	167.22	-32.66%	148.57	222.86	Yes	1.13
Stewart Cr	239.10	174.42	-27.05%	84.68	126.87	No	2.06
Upper Teepee Cr	403.24	335.58	-16.78%	207.09	310.63	No	1.62
West Fork Cougar Gulch	242.24	104.16	-57.00%	60.49	90.74	No	1.72
Yellowdog Cr	323.68	163.13	-49.45%	114.28	171.39	No	1.60

## Phase 2: Field Monitoring



- Big Elk Creek
- Cougar Gulch
- East Fork Steamboat Creek
- Picnic Creek
- Upper Teepee Creek
- Yellowdog Creek
- Stewart Creek
- Skookum Creek

### Phase 2: Field Monitoring

Headwater roads BMP evaluation



### Phase 2: Field Monitoring

Bioassessment with DEQ BURP protocols




### Phase 2: Field Monitoring

Data collection with USFS PIBO protocols



### Phase 2 BURP Monitoring Results - Habitat

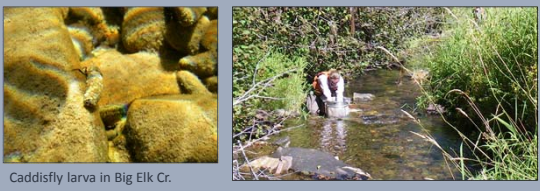


Big Elk Cr. SHI = 1      Cougar Gul. SHI = 3

### Phase 2 BURP Monitoring Results - Habitat

Metric Scores	Big Elk	Cougar	EF Steamboat	Picnic	Tepee	Yellowdog	Stewart	Skookum
Instream Cover	5	6	3	7	6	6	7	6
Large Organic Debris	2	6	3	5	2	10	10	10
Percent Fine Sediment	6	9	7	10	8	10	7	10
Riffle Embeddedness	10	9	8	6	5	9	9	8
Woolman Size Classes	8	8	9	9	9	9	9	8
Channel Shape	5	1	2	1	4	1	3	1
Percent Bank Cover	8	3	10	8	5	8	1	0
Percent Canopy Cover	2	7	6	9	4	6	3	3
Disruptive Features	4	9	9	9	8	5	9	7
Zone of Influence	7	9	9	9	8	6	6	6
Overall SHI Score	57	67	66	73	59	64	64	59
Overall SHI Condition Rating	1	3	3	3	2	2	2	2

### Phase 2 BURP Monitoring Results - Bugs




Caddisfly larva in Big Elk Cr.      Sampling with Hess sampler in Tepee Cr.

### Phase 2 BURP Monitoring Results - Bugs

Metric Scores	Big Elk	Cougar	EF Steamboat	Picnic	Teppee	Yellowdog	Skookum	Stewart
Total Taxa	100	95	100	100	95	85	100	87
Ephemeroptera Taxa	77	77	85	69	54	54	62	54
Plecoptera Taxa	60	70	70	100	80	70	70	60
Trichoptera Taxa	70	80	90	90	90	100	100	80
Percent Plecoptera	58	40	58	85	35	30	100	83
Hilsenhoff Biotic Index (HBI)	85	47	55	56	55	56	62	60
Percent 5 Dominant Taxa	100	88	96	81	71	100	67	85
Scraper Taxa	75	100	100	88	100	100	75	88
Clinger Taxa	96	100	100	100	100	100	100	96
Overall SMI Score (From BAT)	76	76	82	83	74	75	79	75
Overall SMI Condition Rating	3	3	3	3	3	3	3	3

### Phase 2 BURP Monitoring Results - Fish

	Big Elk	Cougar	EF Steamboat	Picnic	Teppee	Yellowdog	Skookum	Stewart
Effort (h)	1,731	2,433	1,074	771	1,298	1,387	4,568	3,082
Area (100 m <sup>2</sup> )	3.5	5.8	5.6	2.4	4.7	3.9	5.5	4.3
Westslope Cutthroat Trout	12	0	5	26	31	9	1	20
Sculpin	202	243	237	149	40	60	386	175
Brook Trout	0	33	0	0	0	0	0	0
Rainbow Trout	0	0	1	0	0	0	0	0
Longnose Dace	0	0	1	0	0	3	0	0
Total Fish Collected	214	276	244	175	71	72	387	195



### Phase 2 BURP Monitoring Results - Fish

Metric Scores	Big Elk	Cougar	EF Steamboat	Picnic	Teppee	Yellowdog	Skookum	Stewart
Number of Coldwater Native Species	100	50	100	100	100	100	100	100
Percent Coldwater Individuals	100	100	98.8	100	100	87.4	100	100
Percent Sensitive Native Individuals	22	1	11	49	90	42	3	36
Number of Coldwater Individuals per Minute	100	100	100	100	58	50	71	100
Number of Sculpin Age Classes	100	100	100	97.5	100	97.5	97.5	92.5
Number of Salmonid Age Classes	50	92.5	97.5	75	50	92.5	5	75
Overall SFI Score (From BAT)	79	74	84	91	83	78	67	82
Overall SFI Condition Rating	2	2	3	3	3	2	2	3


### Synthesis of BURP Results

Condition Rating	Big Elk	Cougar	EF Steamboat	Picnic	Teppee	Yellowdog	Stewart	Skookum
SHI	1	3	3	3	2	2	2	2
SMI	3	3	3	3	3	3	3	3
SFI	2	2	3	3	3	2	3	2
Average	2.0	2.7	3.0	3.0	2.7	2.3	2.7	2.3

When at least two index scores available, an average condition rating of 2.0 or greater is generally considered an indicator of full support for cold water aquatic life. All 8 streams resulted in average scores of 2.0 or greater.

### Additional Habitat Data

- Pool frequency
- Residual pool volume
- Width/depth ratios
- Bank stability

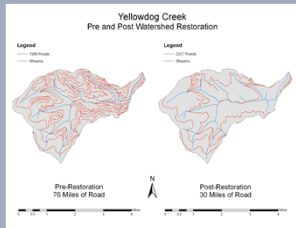


Complete final report in development by DEQ and USFS with Ed Lider will review modeling, BURP and PIBO data, and survey information from headwater roads. Should inform assessments and TMDL 5yr Review.

### Yellowdog Creek Example

- Listed as impaired for sediment in 1994
- 1996 BURP assessments confirmed sediment impairment
- 2002 sediment TMDL approved
- Extensive watershed restoration
- Model estimated 44% sediment load reduction
- BURP data for habitat, macroinvertebrates and fish compare well to reference condition and index scores indicate full support of CWAL
- Have we met the water quality goals in Yellowdog Creek? Can we propose a "delisting" for Yellowdog Creek for sediment?

## Yellowdog Creek Example



- The USFS decommissioned 46 miles of roads in the watershed and removed 111 stream crossings.
- Removing 60 percent of road miles reduced road densities from 10.3 miles per square mile to 4.1 miles per square mile.
- The USFS placed 765 logs in the channel and used boulders to construct more than 100 pool-forming structures.

## Yellowdog Creek Example

