

Appendix A

Summary of Road and Culvert Surveys 2007-2009

In 2007, the Flathead National Forest initiated a monitoring program to assess the condition of roads and culverts behind berms. This program was developed in response to several Biological Opinions issued by the U.S. Fish and Wildlife Service. These opinions were associated with post-fire salvage projects including Moose, Spotted Beetle, Westside Reservoir, and Robert Wedge. The program started with one field crew in the summer of 2007. Two crews were employed in 2008 and 2009. Table 1 includes a summary of inspections completed to date. Tables 2, 3, and 4 include the raw data.

Table 1. Summary of road and culvert data gathered by the Flathead National Forest.

Fiscal Year	Number of Crews	Total Road Miles Surveyed	Total Culverts Surveyed	Total Streams Surveyed
2007	1	38	120	38
2008	2	47	203	63
2009	2	65	148	30

In 2007, 50% of stream culverts inventoried were considered to be high risk¹ and 9 washed out. Of the 9 culverts that failed, 7 were located on one road segment (Table 2). In 2008, no culvert failures were observed and 11% were considered to be high risk following the inspections. In 2009, 3 culvert failures were observed and 43% were considered to be high risk (Table 3). When the monitoring crew encounters culverts that are at high risk of plugging, they reduce the risk by removing vegetation and/or woody material at the inlet and immediately upstream of the inlet. In 2008, the crews cleaned 4 inlets, and in 2009, they cleaned 7 inlets. Cleaning of these culvert inlets eliminated them from the high risk category.

Figures 1 and 2 (pages A7 and A8) include maps that show which roads were surveyed during the monitoring period.

¹ Percentage of culverts rated high as high risk applies only to those in stream channels (not ditch relief culverts).

Table 2. Road and culvert inspections completed in fiscal year 2007.

Road No.	Dist.	Miles	Total Culverts	Cross-drains	Streams	Failures	High Risk	Survey Completion
9839	GV	2.86	26	19	7	0	4	12-Jun
1662	GV	1.53	9	4	5	0	4	13-Jun
803L	GV	2.75	21	16	5	0	1	19-Jun
316G	GV	1.32	0	----	----	----	----	20-Jun
10752	GV	0.48	0	----	----	----	----	20-Jun
316C	GV	1.94	3	1	2	0	1	26-Jun
10758	GV	0.67	0	----	----	----	----	26-Jun
5303	GV	1.27	2	2	0	----	----	27-Jun
5303spur	GV	0.4	0	----	----	----	----	27-Jun
10753	GV	2.92	10	5	5	4	3	26-Jul
10754	GV	3.07	5	1	4	3	3	30-Jul
10801A	GV	0.84	0	----	----	----	----	3-Jul
10801	GV	1.56	3	2	1	0	1	24-Jul
317B	GV	0.7	1	0	1	0	0	24-Jul
Total-GV		22.31	80	50	30	7	17	
10189	HH	0.37	0	----	----	----	----	31-Jul
2860	HH	4.8	3	1	2	1	1	2-Aug
1602	HH	2.52	5	1	4	1	1	8-Aug
11024	HH	2.29	0	----	----	----	----	8-Aug
2817C	HH	0.71	8	8	0	----	----	13-Aug
2817Cspur	HH	0.11	0	----	----	----	----	9-Aug
9831	HH	2.45	0	----	----	----	----	14-Aug
9862	HH	0.79	14	14	0	----	----	20-Aug
9862spur	HH	0.3	0	----	----	----	----	15-Aug
9862spur2	HH	0.11	1	1	0	----	----	16-Aug
9867	HH	0.4	4	4	0	----	----	17-Aug
9871	HH	0.21	2	1	1	0	0	17-Aug
9832	HH	0.61	3	2	1	0	0	22-Aug
Total-HH		15.67	40	32	8	2	2	
Total to Date		37.98	120	82	38	9	19	

Table 3. Road and culvert inspections completed in fiscal year 2008.

Road No.	Dist.	Surveyed MP	Total Culverts	Cross-drains	Streams	Failures	High Risk Before	High Risk After	Survey Completion
590A	HH	2.917	15	13	2	0	2	2	11-Jun-08
11085	HH	0.287	0	----	----	----	----	----	9-Jun-08
590K	HH	0.485	3	3	0	----	----	----	11-Jun-08
590J	HH	0.6	3	3	0	----	----	----	11-Jun-08
11075	HH	0.896	2	0	2	0	1	1	17-Jun-08
11076	HH	0.907	1	0	1	0	0	0	17-Jun-08
5311B	HH	0.689	0	----	----	----	----	----	17-Jun-08
5311C	HH	1.158	3	2	1	0	0	0	18-Jun-08
9697	HH	0.19	3	2	1	0	1	1	19-Jun-08
895L	HH	0.8	0	----	----	----	----	----	18-Jun-08
9695	HH	0.259	4	2	2	0	0	0	19-Jun-08
9880	HH	0.307	0	----	----	----	----	----	19-Jun-08
10186	HH	1.159	4	1	3	0	0	0	23-Jun-08
11105	HH	0.067	0	----	----	----	----	----	2-Jul-08
11106	HH	0.536	0	----	----	----	----	----	2-Jul-08
11107	HH	0.482	0	----	----	----	----	----	2-Jul-08
11108	HH	0.145	0	----	----	----	----	----	2-Jul-08
11109	HH	0.063	0	----	----	----	----	----	2-Jul-08
11110	HH	0.232	0	----	----	----	----	----	2-Jul-08
632	HH	0.339	0	----	----	----	----	----	2-Jul-08
11065G	HH	0.291	0	----	----	----	----	----	7-Jul-08
5251A	HH	0.841	9	7	2	0	1	1	23-Jun-08
5251B	HH	1.283	6	3	3	0	1	1	23-Jun-08
1608	HH	1.469	3	1	2	0	1	0	1-Jul-08
9860	HH	0.16	1	0	1	0	1	0	7-Jul-08
5355	HH	2.26	7	4	3	0	2	0	26-Jun-08
895N	HH	0.113	0	----	----	----	----	----	9-Jul-08
11029	HH	0.651	7	2	5	0	0	0	10-Jul-08
9809	HH	0.907	5	3	2	0	1	1	9-Jul-08
1651Y	HH	1.189	2	1	1	----	----	----	
1651Z	HH	0.895	0	----	----	----	----	----	
1653Y	HH	0.261	0	----	----	----	----	----	
1653Z	HH	0.332	0	----	----	----	----	----	
499	HH	1.86	9	5	4	0	0	0	
499a	HH	0.683	0	----	----	----	----	----	
11028	HH	0.518	3	1	2	0	0	0	
11129	HH	0.62	0	----	----	----	----	----	
11129A	HH	0.166	0	----	----	----	----	----	
9822	HH	0.915	15	12	3	0	0	0	
9798	HH	0.484	2	2	0	----	----	----	
5260	HH	0.844	12	10	2	0	0	0	
10129	HH	1.002	8	6	2	0	0	0	
569X	HH	0.434	0	----	----	----	----	----	

569Y	HH	0.552	0	----	----	----	----	----	
569Z	HH	0.705	0	----	----	----	----	----	
5317A	HH	0.746	0	----	----	----	----	----	
2800A	HH	0.297	0	----	----	----	----	----	
975	HH	4.674	33	17	16	0	0	0	
2808A	HH	0.743	0	----	----	----	----	----	
1630	HH	1.933	19	18	1	0	0	0	
11471	HH	0.87	6	4	2	0	0	0	
5312	HH	1.667	4	4	0	----	----	----	
11092	HH	0.181	0	----	----	----	----	----	
11092A	HH	0.106	0	----	----	----	----	----	
10128	HH	0.443	4	4	0	----	----	----	
10127	HH	0.686	4	4	0	----	----	----	
2816Y	HH	0.175	0	----	----	----	----	----	
11071	HH	2.28	6	1	0	----	----	----	
Total HH		46.754	203	135	63	0	11	7	
Total to Date		46.754	203	135	63	0	11	7	

Table 4. Road and culvert inspections completed in fiscal year 2009.

Road No.	District	Mileage	Total Culverts	Cross-drains	Streams	Failures	High Risk Before	High Risk After	Survey Completion
11071B	HH	0.37	0	----	----	----	----	----	11-Jun-09
1661	HH	0.58	4	3	1	0	0	0	15-Jun-09
1661A	HH	0.36	2	1	1	0	0	0	15-Jun-09
9830	HH	1.70	3	3	0	0	0	0	15-Jun-09
5333	HH	1.87	7	5	2	0	0	0	24-Jun-09
5252	HH	2.35	9	9	0	0	0	0	30-Jun-09
5340	HH	1.04	2	1	1	0	1	1	22-Jul-09
5250	HH	1.54	8	4	4	0	2	1	9-Jul-09
5252Y	HH	0.45	0	----	----	----	----	----	13-Jul-09
5252A	HH	0.77	0	----	----	----	----	----	15-Jul-09
9854A	HH	0.51	1	1	0	0	1	1	29-Jul-09
10330	HH	2.11	1	0	1	3	1	1	5-Aug-09
570	HH	0.92	6	5	1	0	0	0	5-Aug-09
Total HH		14.57	43	32	11	3	5	4	
5385	SL	2.91	4	4	0	0	0	0	22-Jun-09
5389	SL	1.76	1	0	1	0	0	0	7-Jul-09
5388Y	SL	2.22	2	0	2	0	1	0	7-Jul-09
10724	SL	1.72	0	----	----	----	----	----	7-Jul-09
10724A	SL	0.49	0	----	----	----	----	----	7-Jul-09
5387	SL	0.55	0	----	----	----	----	----	7-Jul-09
5388X	SL	1.04	1	1	0	0	0	0	15-Jul-09
5392Y	SL	0.99	0	----	----	----	----	----	3-Aug-09
91067	SL	1.56	0	----	----	----	----	----	3-Aug-09
10212	SL	2.41	13	13	0	0	0	0	4-Aug-09
10321	SL	1.44	0	----	----	----	----	----	10-Aug-09
10320	SL	2.41	0	----	----	----	----	----	10-Aug-09
5398A	SL	0.51	0	----	----	----	----	----	6-Aug-09
5398	SL	0.51	4	4	0	0	1	1	6-Aug-09
10528	SL	1.49	10	10	0	0	0	0	11-Aug-09
10529	SL	1.72	11	8	3	0	0	0	11-Aug-09
9508X	SL	1.23	0	----	----	----	----	----	12-Aug-09
9508B	SL	0.49	1	1	0	0	1	1	12-Aug-09
9508A	SL	0.60	5	5	0	0	0	0	12-Aug-09
Total SL		26.05	52	46	6	0	3	2	
11499	SB	0.79	0	----	----	----	----	----	24-Jun-09
1636	SB	1.55	6	4	2	0	0	0	1-Jul-09
1636A	SB	0.45	2	2	0	0	0	0	1-Jul-09
11498	SB	0.11	0	----	----	----	----	----	30-Jun-09
2803	SB	1.67	2	1	1	0	1	0	29-Jun-09
2835	SB	0.85	1	1	0	0	0	0	29-Jun-09
2804	SB	3.02	5	3	2	0	3	3	30-Jun-09
10123	SB	1.33	4	4	0	0	0	0	8-Jul-09
9861	SB	1.42	5	4	1	0	0	0	20-Jul-09

9861Z	SB	0.28	0	----	----	----	----	----	20-Jul-09
11476	SB	0.32	2	1	1	0	1	0	20-Jul-09
2825	SB	2.12	7	7	0	0	0	0	21-Jul-09
11492	SB	1.12	2	2	0	0	2	2	21-Jul-09
9795	SB	1.04	3	1	2	0	1	0	15-Jul-09
10349	SB	1.69	0	----	----	----	----	----	16-Jul-09
2801A	SB	1.00	0	----	----	----	----	----	16-Jul-09
2826Y	SB	0.25	0	----	----	----	----	----	20-Jul-09
9531X	SB	0.67	0	----	----	----	----	----	21-Jul-09
9531Y	SB	1.39	0	----	----	----	----	----	27-Jul-09
9532	SB	0.91	6	6	0	0	0	0	27-Jul-09
9536	SB	0.79	2	0	2	0	1	1	27-Jul-09
2853	SB	1.19	5	3	2	0	2	0	28-Jul-09
10101	SB	0.72	1	1	0	0	1	1	28-Jul-09
Total SB		24.68	53	40	13	0	12	7	
Total to Date		65.30	148	118	30	3	20	13	

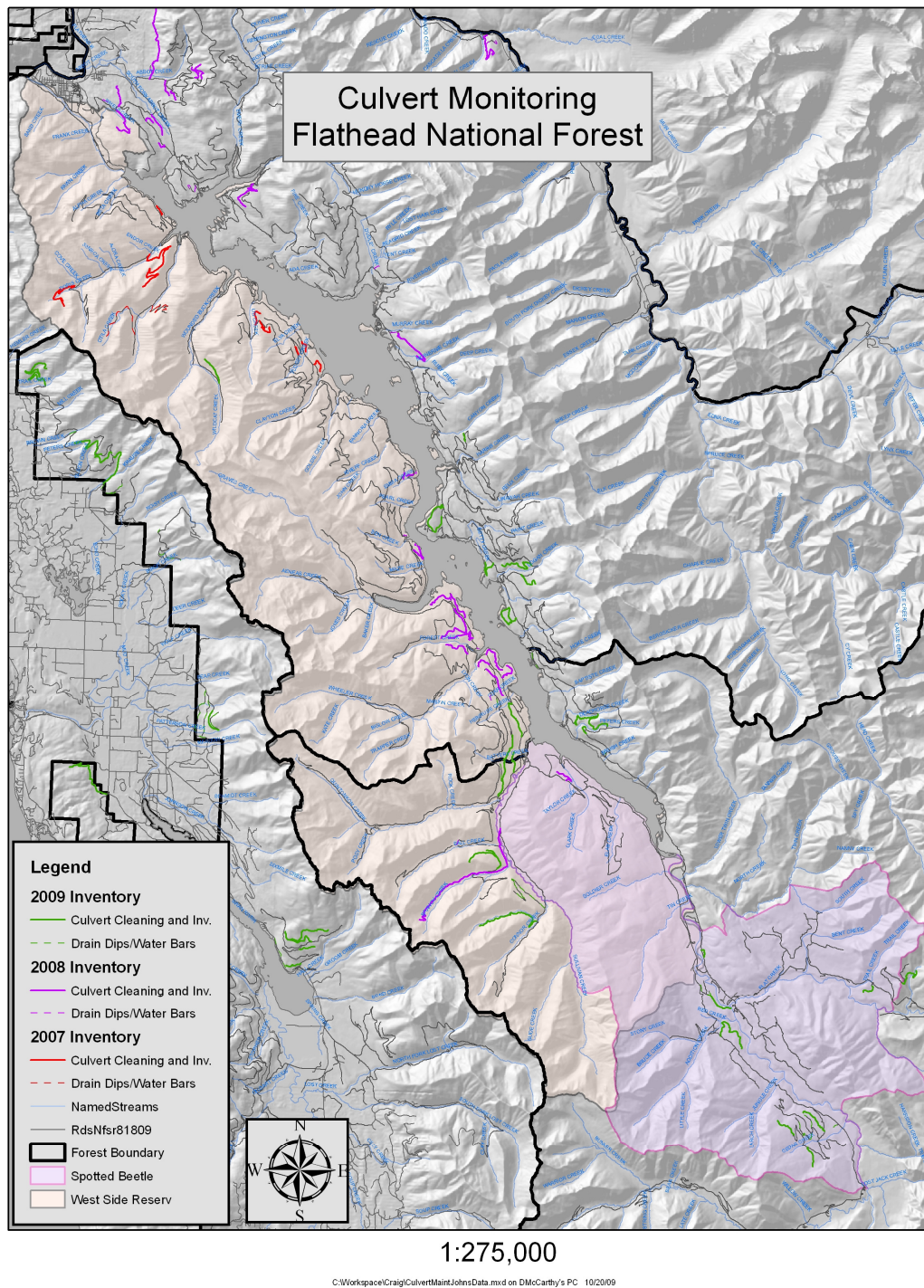


Figure 1. Road and culvert monitoring sites in the Spotted Beetle and Westside Reservoir Project Areas.

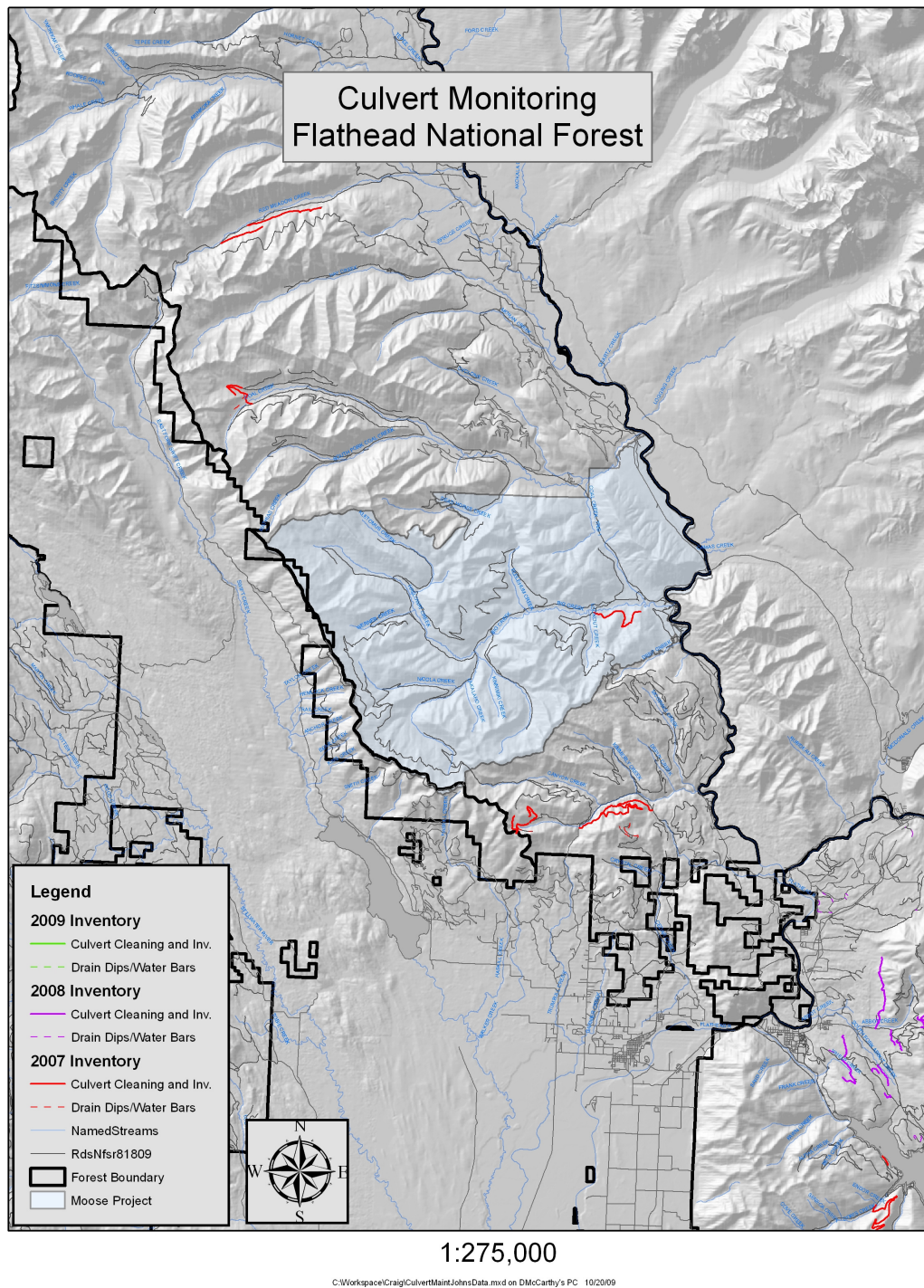


Figure 2. Road and culvert monitoring sites in the Moose Project Area.