

Little Blackfoot TPA 2009 – Sediment and Habitat Assessment QAQC Review

March 9, 2010

1.0 PROJECT OVERVIEW

Sediment and habitat monitoring in the Little Blackfoot TPA was conducted in July of 2009 as outlined in *Little Blackfoot TMDL Planning Area Sediment Monitoring Sampling and Analysis Plan* (DEQ 2009). A total of 19 sites were assessed, with the full sediment and habitat assessment methodology employed at all sites covering a total of 3.8 miles (**Table 1-1**).

Stream Segment	Reach ID	Reach Type	Date	Length (Feet)
Elliston Creek	ELLI08-01	MR-2-2-C	7/6/09	500
Elliston Creek	ELLI08-02	MR-2-2-C	7/6/09	500
Telegraph Creek	TELE04-01	MR-4-3-U	7/6/09	1000
Dog Creek	DOG11-09	MR-0-3-U	7/7/09	400*
Dog Creek	DOG12-04	MR-0-4-U	7/7/09	1000
Telegraph Creek	TELE10-02	MR-0-3-U	7/7/09	1000
Dog Creek	DOG13-03	MR-0-4-U	7/8/09	1000
Spotted Dog Creek	SPOT12-02	MR-0-3-U	7/8/09	1000
Little Blackfoot River	LBR26-06	MR-0-5-U	7/8/09	2000
Little Blackfoot River	LBR27-06	MR-0-5-U	7/9/09	2000
Little Blackfoot River	LBR30-05	MR-0-5-U	7/9/09	2000
Snowshoe Creek	SNOW18-05	MR-0-2-U	7/9/09	1000
Little Blackfoot River	LBR24-03	MR-0-4-U	7/10/09	2000
Trout Creek	TROU17-04	MR-0-2-U	7/10/09	500
Spotted Dog Creek	SPOT01-01	MR-2-2-U	7/14/09	1000
Trout Creek	TROU15-01	MR-2-2-U	7/14/09	1000
Snowshoe Creek	SNOW08-01	MR-4-1-U	7/14/09	400*
Threemile Creek	THRE17-01	MR-0-3-U	7/15/09	600*
Threemile Creek	THRE16-01	MR-2-3-U	7/15/09	1000

*Site length modified due to field conditions or access limitations.

2.0 FIELD DATA COLLECTION

Field data was collected by a field crew comprised of Montana DEQ and PBS&J field staff under the leadership of Banning Starr and Jeff Dunn. Field data was collected following procedures outlined in *Longitudinal Field Methodology for the Assessment of Sediment and Habitat Impairments* (DEQ 2009). This is the third field season in which this specific field data collection methodology has been employed by Montana DEQ.

2.1 Modifications to the Field Methodology

As with all field data collection efforts, modifications to the sampling and analysis plan and the prescribed field methodology are often required as unique situations arise during the field assessment process. Modifications to the field methodology applied during the Little Blackfoot sediment and habitat assessment are described in this section. In addition to these modifications, the sampling and analysis plan was updated following field data collection to accurately represent the field sites assessed.

2.1.1 Site Specific Modifications

- Only 2 cells (400 feet) were assessed in DOG11-09 since a fence line was encountered.
- Only 4 cells (400 feet) were assessed in SNOW08-01 since a breached impoundment was encountered.
- Only 3 cells (600 feet) were assessed in THRE17-01 since a tributary was encountered.

3.0 FIELD DATA ENTRY

Field data entry was performed by PBS&J. During the data entry process, all data was input into electronic format and summary data from each site was compiled into a single database (Little Blackfoot 2009 – Sediment & Habitat Database.xlsx).

3.1 Omissions and Deviations Identified during Field Data Entry

Omissions and deviations identified during field data entry are evaluated in the following sections.

3.1.1 Channel Cross-section Measurements and Slope

- No station was recorded for cross-section 5 in TELE10-02.
- No riffle grid toss was performed in cell 3 of TELE10-02 since there was too much algae on the streambed.
- A slope measurement of 3.6 on DOG13-03 seems too high, though this reach was channelized. The aerial assessment indicated the slope was <2%.
- There were three recorded values for each depth measurement at stations 1, 2, 3, and 4 for the cell 2 cross-section of LBR26-06. While it was unclear which values were correct, the value in the lower left hand corner of each cell was selected for the width/depth ratio calculation.

- No slope measurement was performed in SNOW08-01, though the 2-4% slope estimated during the aerial assessment seems reasonable.
- The thalweg depth was recorded as 0.9 for the cell 5 cross-section in THRE16-01, though the maximum depth was 1.5 in the cross-section measurements. Thus, the 1.5 value was assumed to be the correct thalweg depth. No floodprone width measurements were performed at this cross-section, though field photos indicate the channel is not entrenched.
- In ELLI08-02, no cross-section measurement was performed in cell 4 due to a lack of well-formed riffles.
- In LBR26-06, no cross-section measurement was performed in cell 3 due to a lack of well-formed riffles.
- In LBR27-06, no cross-section measurements were performed in cells 2 or 5 due to a lack of well-formed riffles.
- In LBR30-05, no cross-section measurement was performed in cell 4 due to a lack of well-formed riffles.
- In SPOT12-02, no cross-section measurement was performed in cell 1 due to a lack of well-formed riffles.
- In THRE16-01, no cross-section measurement was performed in cell 2 due to a lack of well-formed riffles.

3.1.2 Pebble Counts and Riffle Stability Index

- Riffle grid toss #3 in cell 5 of ELLI08-02 was based on two tosses instead of three.
- Only two riffle pebble counts were collected in DOG11-09 since only two cells were assessed. Only one riffle grid toss was performed.
- Dominant bar particle size values in cell 1 of SPOT12-02 were recorded in feet and converted into millimeters. The dominant bar particle size data from cell 1 were compared to the pebble count data from cell 2 to determine the RSI value.
- RSI measurements were performed in cells 2 and 3 in LBR24-03. Cell 1 pebble count data was compared to the dominant bar particle size data from cell 2 to determine the RSI value.
- No riffle grid toss was performed in cell 5 of LBR30-05. The field notes did not indicate why this grid toss was not performed.

- In SNOW08-01, the third pebble count was performed in cell 4 since no data was collected in cell 5. No grid toss measurement was performed in the cell 4 riffle.
- No riffle grid toss measurements were performed in cells 3 or 5 in THRE16-01 due to dense algae growth on the streambed.

3.1.3 Pools, Riffles and Large Woody Debris Assessment

- Pool tail-out grid toss #3 in pool 11 of cell 5 of ELLI08-02 was based on two tosses instead of three.
- Depositional spawning area grid toss data in cell 2 of SPOT12-02 was entered for pool 3, though it was indicated that no spawning gravels were observed in pool 3. There were spawning gravels identified in pool 4, though no associated data. Thus, it was assumed that the grid toss data is actually for pool 4.
- The tail crest depth was recorded as “too deep” for pool 4 in LBR26-06 since it was part of a compound pool. Pool 4 was excluded from the residual pool depth calculations.
- No pool cover type was recorded for pool 5 of LBR26-06.
- No pool habitat characteristics were recorded for pool 2 in LBR27-06.
- Maximum pool depths in LBR26-06, LBR27-06 and LBR30-05 were estimated in several instances due to deep water and abundant LWD, which created dangerous wading conditions.
- No pool tail-out grid toss measurements were performed in LBR30-05 due to a lack of potential spawning gravels.
- No pool formative feature or cover type was recorded for pool 5 in TROU15-01.
- No upstream station was recorded for the riffle in cell 2 of LBR24-03 that started at 776. The upstream station was assumed to be 800 corresponding with the top of the cell.
- Pool depths were estimated in pools 11 and 12 of TROU17-04 so as to not disturb a small school of fish that was using these two pools for refugia from the nearly dewatered conditions in the stream during the site visit. Spawning gravels were observed in both pools, but also were not measured.
- The maximum pool depth was estimated in pool 1 of THRE17-01 since the pool was too deep to safely wade. No cover type was noted for this pool.

- The downstream station of pool 2 in THRE17-01 was recorded as station 126, but was assumed to be station 526 since a riffle was noted from stations 401 to 499 and the upstream end of pool 2 was recorded at station 568. For 1000-foot reaches, cells are delineated using 200-foot tapes.
- No grid toss value was recorded for toss #3 in pool 2 in TROU15-01.
- In DOG 11-09, no pool tail-out grid toss measurements were performed due to a lack of potential spawning gravels.

3.1.4 Streambank Erosion Assessment

- Two Add Bank #3's were recorded in SNOW18-05, so the second one was recorded as Add Bank #4.

3.1.5 Riparian Greenline Assessment

- No riparian buffer width was entered at station 50 along river left in ELLI08-01.
- No riparian buffer width was entered at station 350 in ELLI08-02 along either bank.
- For the riparian greenline assessment, left and right banks were switched on the field forms in DOG11-09, TELE04-01, TELE10-02, SPOT12-02, LBR24-03, SPOT01-01, and THRE17-01. Data was entered into electronic format based on left and right bank notes on the field forms.
- No riparian buffer width was entered at station 250 in DOG12-04 along either bank.
- No riparian buffer width was entered at station 100 or station 200 along river right in TELE10-02.
- No riparian buffer width was entered at stations 50, 100, 650, or 700 in DOG13-03 along either bank.
- No riparian buffer width was entered at station 200 or 300 along the right bank in SPOT12-02.
- Greenline data was recorded in rows where only riparian buffer width data should have been recorded on the 2000-foot greenline forms for LBR26-7 and LBR30-05. The greenline tallies were corrected to exclude this data.
- No riparian buffer width was entered at stations 200 and 750 along the right bank in LBR26-06, along with stations 500 and 1600 along the left bank.

- No riparian buffer width was entered at station 1200 along the left bank, station 1500 along the right bank, and station 1950 along the left bank in LBR27-06.
- No riparian buffer width was entered at station 100 along either bank, station 800 along the right bank, station 1350 along the left bank, station 1400 along either bank, and stations 1700, 1800 and 2000 along the left bank in LBR30-05.
- No riparian buffer width was entered at station 600 along either bank or at station 1000 along the right bank in SNOW18-05.
- Overstory canopy cover was noted in the greenline for SNOW18-05, though no trees were present at this site which was dominated by wetland vegetation with a few shrubs.
- No riparian buffer width was entered at station 450 along the left bank in TROU17-04.
- No riparian buffer width was entered at station 600 along either bank in TROU15-01.

3.2 GIS Data Review

Geographic coordinates collected at each site were uploaded into GIS and reviewed relative to the aerial assessment database reach layer and GPS recorded data. During this review, the following issues were identified:

- For LBF27-06, the reach type noted as MR-0-2-U on the field form when it is actually an MR-0-5-U reach type.
- For SNOW08-01, the reach type was identified as MR-2-2-U on field form when it is actually an MR-4-1-U reach type.
- THRE17-02-1 (downstream) is primarily in THRE17-01, but partially in THRE17-02.
- THRE17-02-2 (upstream) is primarily in THRE16-01, but partially in THRE17-01.
- ELLI08-02 is partially in ELLI08-01.
- LBR26-06 is partially in LBR26-07.
- LBR27-06 is partially in LBR28-01.
- LBR30-05 is partially in LBR30-04.
- Site THRE17-01 was identified as THRE17-2-1 on the field forms.
- Site THRE16-01 was identified as THRE17-2-2 on the field forms.

4.0 DATA QUALITY OBJECTIVES (DQOs)

A total of 19 sites were assessed in the Little Blackfoot TPA in 2009, with the full sediment and habitat assessment methodology employed at all sites. For 19 full sediment and habitat assessment sites, there is a potential of 95 cells. Due to field conditions and access limitations as discussed in **Section 2.2.1**, only 2 cells were assessed in DOG11-09, only 4 cells were assessed in SNOW08-01, and only 3 cells were assessed in THRE17-01. Thus, 89 cells were assessed out of a potential 95 cells, for a project completeness of 94% which meets the DQO for completeness of 85% as described in the sampling and analysis plan. Other DQOs include representativeness and comparability. These two DQOs were met through the sampling design, following standard protocols, and observations of watershed conditions made during field reconnaissance and field data collection activities.

5.0 EFFECT OF DEVIATIONS ON PROJECT OBJECTIVES

The goal of this review is to document any deviations from the field methodology and to determine if the observed deviations influence the quality of the data. Based on this data review, identified omissions and deviations have a relatively small influence on the quality of the data. Many of the omissions occurred for parameters which are not typically used for developing TMDL targets, such as pool characteristics and riparian buffer widths. Other omissions slightly reduce sample size, such as a reduced number of cross-section measurements or an incomplete number of grid tosses. Overall, no major issues were identified during this review beyond omissions and deviations that affect the sample size and may increase uncertainty. These should not affect the overall conclusions for each reach.