# APPENDIX G - UNPAVED ROAD SEDIMENT ASSESSMENT BITTERROOT TPA

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# G1.0 INTRODUCTION

This report presents a sediment and culvert assessment of the unpaved road network within the Bitterroot TMDL Planning Area (TPA). This assessment was performed as part of the development of sediment TMDLs for 303(d) listed stream segments with sediment as a documented impairment. Roads located near stream channels can impact stream function through degradation of riparian vegetation, channel encroachment, and sediment loading. The degree of impact is determined by a number of factors, including road type, construction specifications, drainage, soil type, topography, precipitation, and the use of Best Management Practices (BMPs). Through a combination of GIS analysis, field assessment, and modeling, estimated sediment loads were developed for unpaved road crossings and parallel road segments. Existing road conditions were modeled, as well as estimated future road conditions after the application of sediment reducing Best Management Practices (BMPs). Existing culverts were also assessed for fish passage and failure.

The majority of the Bitterroot TPA (USGS HUC ID #17010205) is located within Ravalli County, with a smaller portion in Missoula County, including the southwest corner of the City of Missoula (**Figure G6-1**). The Bitterroot TPA includes the Bitterroot River watershed downstream from the confluence of the East and West Forks near Conner, Montana, as well as the lower Lolo Creek watershed below Lolo Hot Springs. This document details the assumptions, methods, and results from the road sediment analysis for the Bitterroot TPA.

The 2010 303(d) List includes a total of 12 listed stream segments within the Bitterroot TPA that are listed for sediment. 20 stream segments, including 8 segments also listed for sediment, are listed for other habitat alterations. **Table G1-1** includes a summary of sediment impaired stream segments.

# G2.0 DATA COLLECTION

The Bitterroot Unpaved Road Sediment assessment consisted of three primary tasks: 1.) GIS Layer development and summary statistics, 2.) field assessment and sediment modeling, and 3.) sediment load calculations and allocations for sediment listed watersheds and the entire Bitterroot TPA. Additional information on assessment techniques is available in prior reporting for this project: *Task 1. Road GIS Layers and Summary Statistics* (MDEQ 2007), and *Task 2. Sampling and Analysis Plan* (MDEQ 2007).

## G2.1 SPATIAL ANALYSIS

Using road layers provided by the Bitterroot National Forest (BNF), Lolo National Forest (LNF), Missoula County and Ravalli County, road crossings and parallel segments in the road network were identified and classified relative to 6th code subwatershed, land ownership, and landscape type. These classifications captured a statistically representative sample of roads within the entire watershed, based on a number of road conditions (subwatershed, road design, soil type, maintenance level, etc). Summary statistics show that there are a total of 3634 road crossings in the Bitterroot TPA, with 3357 unpaved crossings and 277 paved crossings. Landscape layers were downloaded from the EPA 2002 Level 4 Ecoregions, and were classified into Mountain, Foothill, and Valley landscape types as follows: Mountain Landscape *(Eastern Batholith , High Idaho Batholith, Glaciated Bitterroot Mountains and Canyons, Lochsa Uplands*

*Grave Creek Range-Nine Mile Divide)*; Foothills Landscape *(Bitterroot-Frenchtown Valley -without digitized valley bottom areas);* and Valley Landscape *(The valley landscape type was developed by digitizing the valley bottoms throughout the TPA using a hill-shaded Digital Elevation Map (DEM), aerial and color infrared photography, topographic maps, and land use in GIS).* There are 2336 Mountain crossings (2260 unpaved), 900 Foothill crossings (789 unpaved), and 398 Valley crossings (308 unpaved). There are 1535 road crossings on federal lands (1479 unpaved), 1567 crossings on private lands (1359 unpaved), 490 crossings on Plum Creek Timber land (479 unpaved), and 42 crossings (40 unpaved) crossings on state lands. A random subset of unpaved crossing sites was generated for field assessment based on the proportion of total crossings within each landscape type, with approximately 5% of the total unpaved crossings assessed (199 sites). Parallel road segments were identified as areas where roads encroach upon the stream channel, and total road lengths within 50-foot and 150-foot buffer zones were generated. There is a total of 141 miles of unpaved parallel road segments within 50 feet of stream channels and 341 miles within 150 feet. Statistics generated using GIS were updated in the field, as described in **Section 2.4**.

## G2.2 FIELD DATA COLLECTION

A total of 136 unpaved crossings and 63 parallel segments were evaluated in the field (**Figure 6-2**). Eighty nine crossings were assessed in the mountain landscape, 35 crossings were assessed in the foothill landscape, and 12 crossings were assessed in the valley landscape type. In the field, parallel segments were selected based on best professional judgment while traveling roads on which specific crossings were selected for evaluation. When a parallel reach was encountered, the reach was divided into smaller segments and assessed at pre-selected intervals to eliminate sample bias. Generally, the majority of parallel road segments are located in narrow stream valleys or canyons in foothill and mountain landscapes, where roads are constructed near streams. Forty eight parallel segments were assessed in the mountain landscape type and 15 segments were assessed in the foothill landscape type. Six of the 48 mountain parallel sites were paved. No parallel segments were encountered or assessed in the valley landscape type due to the small overall area of the valley landscape, and the observation that the majority of valley roads were paved and/or did not parallel a stream channel.

## G2.3 SEDIMENT ASSESSMENT METHODOLOGY

The road sediment assessment was conducted using the WEPP:Road forest road erosion prediction model (http://forest.moscowfsl.wsu.edu/fswepp/). WEPP:Road is an interface to the Water Erosion Prediction Project (WEPP) model (Flanagan and Livingston, 1995), developed by the USDA Forest Service and other agencies, and is used to predict runoff, erosion, and sediment delivery from forest roads. The model predicts sediment yields based on specific soil, climate, ground cover, and topographic conditions. Specifically, the following model input data was collected in the field: soil type, percent rock, road surface, road design, traffic level, and specific road topographic values (road grade, road length, road width, fill grade, fill length, buffer grade, and buffer length). In addition, supplemental data was collected on vegetation condition of the buffer, evidence of erosion from the road system, and potential for fish passage and culvert failure.

Site specific climate profiles were created using data from the Western Regional Climate Center (http://www.wrcc.dri.edu). Climate stations were selected from within the Bitterroot TPA boundary that exhibited similar conditions for each specific landscape type. The Stevensville station (247894: 3380 ft elevation, 12.46-inches annual precipitation), was selected for valley sites, the Darby station (242221: 3880-feet elevation, 16.27-inches annual precipitation) was selected to model the foothill sites, and the

Lolo Hot Springs 2 NE station (245146: 4060-feet elevation, 24.95-inches annual precipitation) was used to model the mountain sites.

Generally, 30-year model simulations are adequate to obtain a reliable average erosion estimate. However, in drier climates (less than 500 mm of precipitation), 50-year or longer simulations are necessary to obtain average erosion estimates. For the Bitterroot TPA, 30-year simulations were run for mountain sites, and fifty-year simulations were run for valley and foothill sites.

Some road conditions encountered in the field are not accurately represented in the WEPP:Road design options; as a result, some adjustments were made to the model to more appropriately represent these types of roads. **Attachment B** contains a description of model or site condition adjustments, as recommended by the model author or by professional judgment.

## G2.4 FIELD ADJUSTMENTS

Field conditions required that a number of sites be moved to different locations due to lack of access (landowner permission or road condition), lack of an existing stream channel, or inaccuracies in the road or stream GIS layers, which showed crossings which were not accurate. It was noted during field activities that some roads were classified as unpaved on the GIS layer attributes, when in fact, they were found to be paved roads upon field inspection. Also, some road crossings on parallel segments were not present upon field inspection. GIS layers often contain additional crossings when road and stream layers parallel each other close together. Records were kept in the field and edits were made to the GIS layers. Revised unpaved road network statistics were generated, which resulted in unpaved road crossings decreasing from 3357 to 3294 crossings (**Table G2-1**).

The ability to generate completely accurate road and stream crossing layers is not feasible; however, this revised tally represents a more accurate representation of existing conditions.

**Table G2-1. Total Revised Number of Unpaved Crossings**

| Landscape Type | Unpaved Road Crossings using GIS Only | Revised Unpaved Crossings After Field and Map Adjustments |
|---|---|---|
| Mountain | 2260 | 2238 |
| Foothill | 789 | 761 |
| Valley | 308 | 295 |
| **Total** | **3357** | **3294** |

Total unpaved road crossings and crossing densities were also classified by major land ownership within the TPA, with results shown in **Table G2-2**.

**Table G2-2. Unpaved Road Crossings Sorted by Major Land Ownership**

| Land Ownership / Management Unit | Number of Unpaved Crossings | Ownership Area (sq mi) | Ownership Area (%) | Crossing Density (crossings/sq mi) |
|---|---|---|---|---|
| United States Forest Service | 1471 | 1031.2 | 56.6% | 1.43 |
| State of Montana | 41 | 52.7 | 2.9% | 0.78 |
| Plum Creek Timber | 475 | 101.4 | 5.6% | 4.68 |
| Private | 1307 | 634.2 | 34.8% | 2.06 |
| Water | 0 | 2.32 | 0.1% | 0.0 |
| **Total** | **3294** | **1821.8** | **100%** | **1.81** |

USFS land contains the most unpaved road crossings, and Plum Creek Timber land has the highest density of road crossings when compared with ownership area.

## G2.5 MEAN SEDIMENT LOADS FROM FIELD ASSESSED SITES

Field assessment data and WEPP:Road modeling results were used to develop sediment loads based on various watershed criteria. A standard statistical breakdown of loads from the unpaved road network within each sediment-listed watershed was generated using the applicable dataset of field assessed crossing and parallel sites. Mean load and contributing length, median load, maximum and minimum loads, and 25$^{th}$ and 75$^{th}$ percentile loads were calculated for unpaved road crossings within each landscape type that was the basis of the field assessment. Mean sediment loads from unpaved road crossings were estimated at 0.12 tons/year in mountain landscapes, 0.22 tons/year in the foothill landscapes, and 0.07 tons/year in the valley landscapes. A statistical summary of sediment loads for field assessed sites are included in **Table G2-3**.

**Table G2-3. Sediment Load Summary for Field Assessed Crossings by Landscape Type**

| Statistical Parameter | Mountain | Foothill | Valley | Total of Field Assessed Crossings |
|---|---|---|---|---|
| Number of Sites (n) | 89 | 35 | 12 | 136 |
| Mean Contributing Length (ft) | 241 | 369 | 326 | 283 |
| Mean Load (tons/year) | 0.12 | 0.22 | 0.07 | 0.14 |
| Median Load (tons/year) | 0.02 | 0.09 | 0.05 | 0.03 |
| Maximum Load (tons/year) | 2.42 | 1.79 | 0.28 | 2.42 |
| Minimum Load (tons/year) | 0 | 0 | 0 | 0 |
| 25th Percentile (tons/year) | 0.007 | 0.03 | 0.006 | 0.007 |
| 75th Percentile (tons/year) | 0.09 | 0.24 | 0.11 | 0.10 |

The sediment load summary shows significant differences between minimum and maximum load values, as well as between mean and median values, especially for mountain and valley landscape types. These data suggest that a small number of high sediment load crossing sites impact the average values.

Mean sediment loads were calculated for parallel road segments, and loads were then normalized to a per-mile value to account for differences in contributing road length. Mean sediment loads from unpaved parallel road segments were estimated at 2.21 tons/year/mile in mountain landscapes and 0.31 tons/year/mile in foothill landscapes. No valley parallel segments were assessed in the field due to the small overall area of the valley landscape and the majority presence of paved roads or roads that did not parallel streams. As a result, the mean sediment loads from the mountain and foothill parallel segments were averaged together to obtain an estimated sediment load of 1.26 tons/year/mile for valley parallel segments (**Table G2-4**). A summary of modeling results from field assessed sites is located in **Attachment A**.

**Table G2-4. Sediment Load Summary from Unpaved Field Assessed Parallel Sites by Landscape Type**

| Statistical Parameter | Mountain | Foothill | Valley | Total of Field Assessed Parallel Segments |
|---|---|---|---|---|
| Number of Sites (n) | 41[(1)] | 15 | 0 | 56 |
| Mean Contributing Length (ft) | 1234 | 1046 | NA | 1204 |
| Mean Load (tons/year/mile) | 2.21 | 0.31 | 1.26 [(2)] | NA |
| Median Load (tons/year/mile) | 0.16 | 0.17 | NA | 0.17 |
| Maximum Load (tons/mile/year) | 29.1 | 1.84 | NA | 29.1 |
| Minimum Load (tons/year/mile) | 0 | 0 | NA | 0 |

[(1)] Paved sites removed from total

[(2)] Average of mountain and foothill totals

The parallel segment load summary also shows significant differences between mean and median loads, and modeling results showed that a small number of high load parallel reaches impact the average values. There is also a large difference in mean sediment load between the mountain and foothill landscapes. This is likely due to a lack of suitable road construction locations in higher mountain elevations, resulting in more roads being constructed in narrow stream valleys with smaller buffer distances.

## G2.6 EXTRAPOLATION TO WATERSHED SCALE

Total unpaved road crossings and parallel road distances were further defined by land ownership and subwatershed. USGS 6th code subwatersheds were used as a basis for road sediment categorization in order to provide means for identifying the most impacted areas, and opportunities for potential restoration planning (**Figure G6-3**). Some 303(d) listed streams did not correlate with 6th code subwatershed boundaries; as a result, these watersheds were digitized and reported separately, to avoid duplication of results with the 6th code layer. The following 303(d) streams were reported separately from the 6th code subwatershed in which they are located: Lick Creek, Lower Bear Creek, McClain Creek, Muddy Spring Creek, and the North Fork of Rye Creek. A summary of unpaved road conditions by 6th code/303(d) subwatershed is included as **Table G2-5**; road crossing and parallel road distance sorted by ownership and landscape type is included in **Table G2-6** and **Table G2-7**.

The road network was also classified by major landowner and land management within the watershed, as various entities and administrative controls direct operation and maintenance of the road network. Four major landowner classifications were developed: United States Forest Service (USFS), State of Montana, Plum Creek Timber Company, and private landowners. Plum Creek Timber is the largest private landowner in the TPA, and was classified separately. Within each major land category, crossings and parallel segments were classified by landscape type. Average sediment loads developed for mountain, foothill, and valley sites were used to calculate total sediment loads for the watershed, and results are reported by these major land units within 6th code subwatersheds. Extrapolation of these results to the remainder of road crossings within the Bitterroot TPA assumes that the random subset of crossings assessed as part of this study is representative of the entire watershed.

# G3.0 UNPAVED ROAD NETWORK LOAD ANALYSIS

Mean sediment loads from field assessed sites were used to extrapolate existing loads throughout the entire watershed. Mean loads for unpaved crossings within mountain (0.12 tons/year), foothill (0.22 tons/year), and valley (0.07 tons/year) landscape types were applied to the total number of crossings within the TPA, and further classified by 6th code HUC and land ownership. The existing total Bitterroot watershed sediment load from unpaved road crossings was estimated at 461.3 tons/year, and the total existing load from parallel road segments is estimated at 248.4 tons/year (**Table G3-1**). Detailed sediment loads for road crossings and parallel road segments classified by ownership and landscape type within each 6th code/303(d) subwatershed are included in **Table G3-2** and **Table G3-3**. Total sediment loads from the unpaved road network classified by ownership and landscape type within each 6th code/303(d) subwatershed are shown in **Table G3-4.**

**Table G3-1. Sediment Load Summary from Unpaved Road Crossings – Existing Conditions**

| Road Feature | Landscape Type | Total Number of Crossings | Mean Sediment Load (Tons/year) | Total Sediment Load (Tons/year) |
|---|---|---|---|---|
| Crossing | Mountain | 2238 | 0.12 | 268.6 |
| Crossing | Foothill | 761 | 0.22 | 167.4 |
| Crossing | Valley | 295 | 0.07 | 25.3 |
| **Total:** | | **3294** | | **461.3** |
| **Road Feature** | **Landscape Type** | **Total Parallel Distance w/in 50-feet (Mi)** | **Mean Sediment Load (Tons/year/mile)** | **Total Sediment Load (Tons/year)** |
| Parallel | Mountain | 103.6 | 2.21 | 229.0 |
| Parallel | Foothill | 29.1 | 0.31 | 9.0 |
| Parallel | Valley | 8.3 | 1.26 | 10.4 |
| **Total:** | | **141.0** | | **248.4** |
| **Total Bitterroot TPA:** | | | | **709.7** |

## G3.1 SEDIMENT LOAD FROM ROAD CROSSINGS

Road crossing results showed that the Lower Lolo Creek (34.6 tons/year), Lolo Creek-Grave Creek (23.2 tons/year), and the Bitterroot Rover-Larry Creek (20.2 tons/year) contained the three highest sediment loads from unpaved road crossings (**Table G3-2**). The total sediment load from unpaved crossings was 461.3 tons/year from a total of 3294 crossings, or an average of 0.14 tons/year/crossing across all land units. The majority of sediment load is generated from crossings on private land (216.6 tons/year), followed by USFS land (177.5 tons/year), and Plum Creek Timber land (57.1 tons/year).

## G3.2 SEDIMENT LOAD FROM PARALLEL ROAD SEGMENTS

Parallel road segment results showed that the Lower Lolo Creek (27.2 tons/year), Lolo Creek-Grave Creek (24.2 tons/year), and Upper Rye Creek (15.1 tons/year) watersheds contained the three highest sediment loads from parallel road segments (**Table G3-3**). The total sediment load from parallel road segments was 242.8 tons/year from a total of 141 miles of road within 50-feet of streams, or an average of 1.72 tons/year/mile across all landscape types. The majority of sediment load is generated from parallel road segments on USFS land (127.4 tons/year), followed by private land (57.1 tons/year), and Plum Creek Timber land (54.1 tons/year).

The study originally intended to evaluate parallel road distances within two buffer zones (50 and 150 feet). Field observations indicated that the majority of parallel road segments did not appear to contribute significant sediment to streams unless buffer distances were very small. WEPP:Road modeling results supported these observations, as 99% of sediment load from parallel road segments occurred within 50-feet of streams (**Figure G3-1.**). Furthermore, a large majority of the load within 50-feet occurred at distances less than 20-feet.

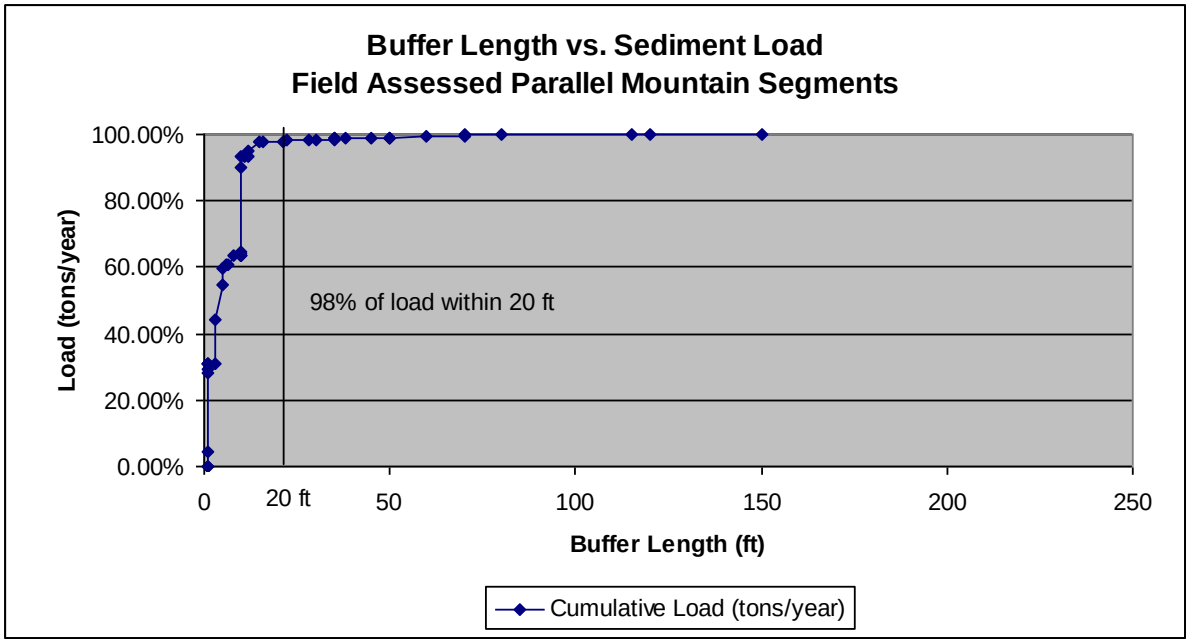


**Figure G3-1. Cumulative Parallel Sediment Load vs. Buffer Length**

**Figures G3-2** and G**3-3** show the differences noted in the field between parallel sites with small and large buffer lengths. Parallel sites with buffer lengths greater than 20 feet have a greater filtering capacity and potential for sediment removal.

**Figure G3-2. Parallel Segment BRLC-F161P – Average Buffer Distance 75 feet**

**Figure G3-3. Parallel Segment ULHC-M165P – Average Buffer Distance <10 feet**

## G3.3 CULVERT ASSESSMENT

Culverts were analyzed for their ability to allow for fish passage, and for their ability to pass adequate flood flows. Of the 133 field assessed road crossing sites, field sites with bridges and decommissioned sites were removed from the dataset, along with any sites where any of the required screening data could not be accurately collected. After removing these sites from the dataset, sixty-seven (67) culverts were determined to be suitable for assessment (**Figure G6-4**).

### G3.3.1 Fish Passage

Measurements were collected at each field assessed crossing site, and these values were used to estimate if culverts represented fish passage barriers at various flow conditions. The fish passage evaluation was completed using the criteria listed in Table 1 of the document *A Summary of Technical Considerations to Minimize the Blockage of Fish at Culverts on National Forests in Alaska* (USFS, September 27, 2002). The analysis uses site-specific information to classify culverts as green (passing all lifestages of salmonids), red (partial or total barrier to salmonids), or grey (needs additional analysis). Indicators used in the classification are the ratio of the culvert width to bankfull width (constriction ratio), culvert slope, and outlet drop, with large (>48-inches) and small (<48-inches) culvert groups evaluated differently. Failure of any one of the three indicators results in a red classification. Using the Alaska fish passage analysis, 56 of 67 culverts (84%) were classified as partial or total fish barriers, 8 of 67 (12%) were classified as needing additional evaluation, and only 3 of 67 culverts (4.5%) were classified as capable of passing fish at all flows and life stages (**Table G3-5A** and **Table G3-5B** ).

**Table G3-5A. Fish Passage Analysis for Selected Culverts**

| Culvert Classification or Indicator* | Definition of Indicator | Number of Culverts | Percentage of Total Culverts Assessed (n = 67) |
|---|---|---|---|
| Green (1) | High certainty of meeting juvenile fish passage at all flows | 3 | 4.5% |
| Gray (2) | Additional and more detailed analysis is required to determine juvenile fish passage ability | 8 | 12.0% |
| Red (3) | High certainty of not providing juvenile fish passage at all desired stream flows | 56 | 83.5% |

*The number in parenthesis will be used to denote the respective color in **Table 3-5B**.

Constriction ratios less than 1.0 not only indicate a potential fish passage problem, but also an increased potential for culvert failure. Fifty nine of the 67 culverts assessed (88%) have a constriction ratio less than 1.0.

## G3.3.2 Culvert Failure Potential

Each culvert with available data was evaluated to determine peak flow using USGS regression equations developed by Omang (July 1992) for un-gaged sites, and flow estimates using Manning's equation. Using the regression equations, peak discharge flows were developed for the 2-, 5-, 10-, 25-, 50-, and 100-year recurring intervals for each selected culvert. Montana is divided into eight hydrologic regions, with a unique set of equations developed for each region. The Bitterroot TPA is located in the West Region, and independent variables within these equations are drainage area (square miles) and precipitation (inches). Drainage area above each culvert was calculated using a digital elevation model (DEM) and the ArcSwat extension in GIS. The average mean annual precipitation was calculated within each drainage area from a mean precipitation layer available on NRIS (Montana Average Annual Precipitation GIS layer, 1971-2000, PRISM Group).

Using site-specific culvert information collected in the field (including material, shape, dimensions, and slope) a peak flow was also calculated using Manning's equation. Variables in Manning's equation are culvert area, hydraulic radius, slope, and roughness coefficient (based on culvert material). The peak flow calculated using Manning's equation was compared with Omang values to estimate the maximum storm event that each culvert could convey without water backup. Of the 67 culverts analyzed for fish passage, 58 were analyzed for failure potential due to the inability to collect slope measurements in the field at some locations. The number of culverts passing each specific storm event is shown in **Table G3-6**.

**Table G3-6. Percent of Culverts Passing Design Storm Events**

| Design Storm Event | Number of Culverts Passing | Number of Culverts Failing Specific Flow | Cumulative Percent Passing |
|---|---|---|---|
| Total Culverts | 58 | | 100% |
| Q2 | 51 | 7 | 88% |
| Q5 | 47 | 4 | 81% |
| Q10 | 39 | 8 | 67% |
| Q25 | 37 | 2 | 64% |
| Q50 | 36 | 1 | 62% |
| Q100 | 34 | 2 | 59% |

As peak discharge increases, so does the percentage of culverts incapable of passing the greater flows. Based on the peak flow analysis, it appears that most culverts were designed to pass the Q100 flow, as the majority of culverts (59%) passed the Q100. However, there were 21 culverts (36%) that fail to pass the Q25 design flow.

Potential road fill volume at risk for delivery in the event of a culvert failure was calculated using field measurements of the road prism over the culvert. The volumes calculated are conservative, assuming that the entire road prism above the culvert fails to bankfull width and is delivered to the stream, which will likely not always be the case. In some instances only part of the road fill may be delivered, and in other cases water may simply overtop the road and the culvert will stay intact.

It is difficult to develop specific road crossing allocations for sediment delivered in the event of a culvert failure, as there are several factors that may impact the accuracy of the data. First, peak flows generated using the USGS regression equations are subject to large standard errors that may substantially over or underestimate peak discharge. In addition, peak flows generated using Manning's equation rely heavily on culvert slope. Slope values measured during field activities were estimated using a handheld inclinometer where accessible, and visual estimates were recorded where access or use of an inclinometer was not possible. Different slope estimates may lead to variations in peak flow calculations. Second, the culvert assessment was conducted on a small subset of culverts, which may or may not be representative of the entire Bitterroot TPA. Third, it is difficult if not impossible to estimate which culverts will fail in any given year, and what percentage of at-risk fill material will be delivered to the stream. Due to these difficulties in sediment delivery estimation, specific sediment loads were not developed for each crossing.

# G4.0 Application of Best Management Practices

Sediment impacts are widespread throughout the Bitterroot TMDL Planning Area, and sediment loading from the unpaved road network is one of several sources within the watershed. Application of Best Management Practices (BMPs) on the unpaved road network will result in a decrease in sediment loading to streams. Various BMP sediment reduction scenarios were evaluated based on reductions in contributing road length, reduction in road crossing density, and combinations of the two approaches.

The selected scenario for estimating sediment load reductions was calculated by assuming a uniform reduction in contributing road length to 200-feet for each unpaved crossing and 500-feet for each parallel road segment. Load reductions from potential culvert failures will be addressed on a case-by-case basis depending on a number of evaluation factors.

Due to the extent of the unpaved road network and the resulting inability to assess it in its entirety, generalized assumptions are necessary for modeling the effects of BMPs. Restoration efforts would need to consider site-specific BMPs that, on average, would likely be represented by the modeling assumptions. Other management issues that will impact BMP scenarios are the ability to perform restoration work within the different land ownership categories.

## 4.1 Contributing Road Length Reduction Scenarios

A contributing road length reduction scenario for road crossings was selected assuming a length reduction to 200 feet (100-feet on each side of a crossing or 200-feet on one side). On crossing locations

in excess of this length reduction scenario, road lengths were reduced to the corresponding post-BMP scenario of 200-feet. No changes were made to crossing locations where the contributing road length was less than the 200-foot BMP reduction scenario. The 200-foot BMP scenario was evaluated using the WEPP:Road model, so potential sediment load reductions could be estimated. Reduced mean sediment loads were then extrapolated to the entire watershed in the same manner in which the existing sediment loads were calculated. For the 200-foot BMP scenario, mean sediment loads would be reduced from 0.12 tons/year to 0.04 tons/year for mountain crossings, from 0.22 tons/year to 0.05 tons/year for foothill crossings, and from 0.07 tons/year to 0.03 tons/year for valley crossings.

A contributing road length scenario for parallel road segments was selected assuming a length reduction to 500-feet. During field assessment, an attempt was made to determine the average load of parallel road segments by collecting data at pre-selected intervals within a total parallel distance (i.e. every 0.5 miles over a 3-mile segment). This method eliminates the bias of collecting data from portions of the road that are near the stream. This approach was recommended by the model author. Field-assessed parallel road distances in excess of the selected road length reduction were reduced to the post-BMP scenario of 500-feet.

For the 500-foot BMP scenario, mean sediment loads would be reduced from 2.21 tons/year/mile to 0.88 tons/year/mile for mountain parallel segments and from 0.31 tons/year/mile to 0.25 tons/year/mile for foothill parallel segments. Since no valley parallel road segments were assessed in the field, 1.26 tons/year was used for the valley parallel road segments, which is the average of the mountain and foothill totals. The average load would be reduced from 1.26 tons/year/mile to 0.57 tons/year/mile. Estimated summary load reductions by landscape type are show in **Table G4-1**.

**Table G4-1. Estimated Sediment Load Summary – Reduce Crossing Length to 200-feet and Parallel Length to 500-feet**

| Road Feature | Landscape Type | Total Number of Sites | Mean Sediment Load (Tons/year) | Total Sediment Load (Tons/year) | Load Reduction % |
|---|---|---|---|---|---|
| Crossing | Mountain | 2238 | 0.04 | 93.5 | 65.2% |
| Crossing | Foothill | 761 | 0.05 | 40 | 76.1% |
| Crossing | Valley | 295 | 0.03 | 9.9 | 60.9% |
| **Total** | | **3294** | | **143.4** | **68.9%** |
| **Road Feature** | **Landscape Type** | **Total Parallel Distance Within 50-feet (Miles)** | **Mean Sediment Load (Tons/year/mile)** | **Total Sediment Load (Tons/year)** | **Load Reduction %** |
| Parallel | Mountain | 103.6 | 0.88 | 91.1 | 60.2% |
| Parallel | Foothill | 29.1 | 0.25 | 7.1 | 21.1% |
| Parallel | Valley | 8.3 | 0.56 | 4.7 | 54.8% |
| **Total** | | **141.0** | | **102.9** | **58.6%** |
| **Total Bitterroot TPA:** | | | | **246.3** | **65.3%** |

Total sediment load from road crossings would be reduced from 461.3 tons/year to 143.4 tons/year (68.9% reduction), assuming all sites were fully BMP'd. Total sediment load from parallel road segments would be reduced from 248.4 tons/year to 102.9 tons/year (58.6% reduction).

The most significant reduction in sediment load occurs in the mountain landscape type for both crossing and parallel segments. Estimated total sediment load reductions for crossings with a 200-foot contributing length and parallel segments with a 500-foot contributing length were also classified by 6th code HUC/303(d) watershed assuming all sites were fully BMP'd (**Table G4-2** and **Table G4-3**). Total sediment load reductions classified by subwatershed are also shown in **Table G4-4**.

## 4.2 CULVERT REPLACEMENT RECOMMENDATIONS

USFS documentation (Inland Native Fish Strategy, Environmental Assessment, 1995) recommends that as old culverts are replaced, new culverts should be designed to pass the 100-year flow event. It is recommended that all culvert crossings in the Bitterroot TPA be upgraded to pass the Q100 flood event. It is also recommended that culvert replacements be completed in a manner that allows for full fish and Aquatic Organism Passage (AOP). Specifically, culverts would be sized with constriction ratios at 1.0 or greater, and with a goal of re-creating the stream channel through the crossing to match those channel conditions outside of the crossing influence.
The identification of priority culverts for replacement should be on the following factors:

1.) Inability to pass the Q25 design flow;
2.) Constriction ratio <0.70;
3.) Location on a perennial fish bearing stream;
4.) Fill at risk of being delivered to stream exceeds the median value of 12.2 tons/crossing

Achieving full culvert replacement will take many years to complete, and some culverts on private land may never be replaced. This will result in continued loads from culvert failures in the foreseeable future; however, continued investment in the replacement of culverts failing the above criteria will significantly reduce sediment loads over time.

## 4.3 ADDITIONAL BMPS

As an alternative to or in combination with reductions in contributing road length or crossing density, other potential BMPs are available that would reduce sediment loading from the unpaved road network. Road sediment reduction strategies such as the installation of full structural BMPs at existing road crossings (drive through dips, culvert drains, settling basins, silt fence, etc), road surface improvement, reduction in road traffic levels (seasonal or permanent road closures), and timely road maintenance to reduce surface rutting are all BMPs that would lead to reduced sediment loading from the road network.

# G5.0 REFERENCES

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MDEQ 2007. Task 2. Sampling and Analysis Plan, Bitterroot TPA. Prepared by Water & Environmental Technologies, PC. Prepared for Montana Department of Environmental Quality, Water Quality Planning Bureau, Helena, Montana.

MDEQ 2007. Unpaved Road Sediment Assessment, Upper Jefferson River TMDL Planning Area, Prepared by Water & Environmental Technologies, PC. Prepared for Montana Department of Environmental Quality, Water Quality Planning Bureau, Helena, Montana.

MDEQ 2007. Unpaved Road Sediment Assessment, Yaak River TMDL Planning Area, Prepared by Water & Environmental Technologies, PC. Prepared for Montana Department of Environmental Quality, Water Quality Planning Bureau, Helena, Montana.

MDEQ 2005. Culvert Analysis, Prospect Creek TMDL. Prepared by Lolo National Forest with Revisions by River Design Group. Prepared for Montana Department of Environmental Quality, Water Quality Planning Bureau, Helena, Montana.

Inland Native Fish Strategy, Environmental Assessment. 1995. Decision notice and finding of no significant impact. U.S. Department of Agriculture, Forest Service, Intermountain, Northern, and Pacific Northwest Regions.

U.S. Geological Survey 1992. Analysis of the Magnitude and Frequency of Floods and the Peak Flow Gauging Network in Montana, R.J. Omang. Water Resources Investigations Report 92-4048.

USDA Forest Service 1999. FS WEPP - Forest Service Interfaces for the Water Erosion Prediction Project Computer Model. Rocky Mountain Research Station and San Dimas Technology and Development Center.

Elliott, William J, PE, PhD, Team Leader, Rocky Mountain Research Station, Moscow, ID - personal communication.

## G6.0 FIGURES

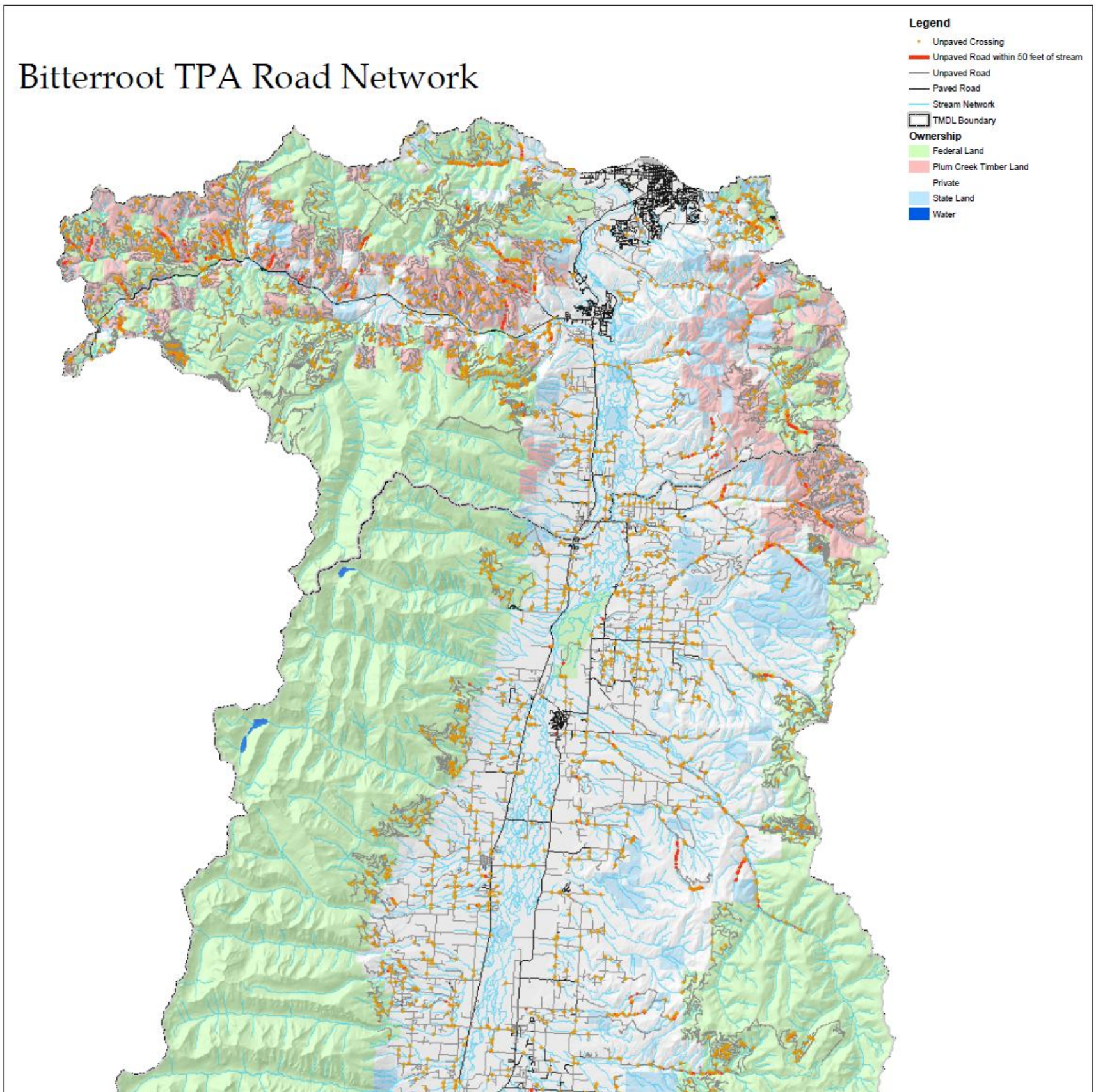


**Figure G6-1. Bitterroot TPA Road Network**

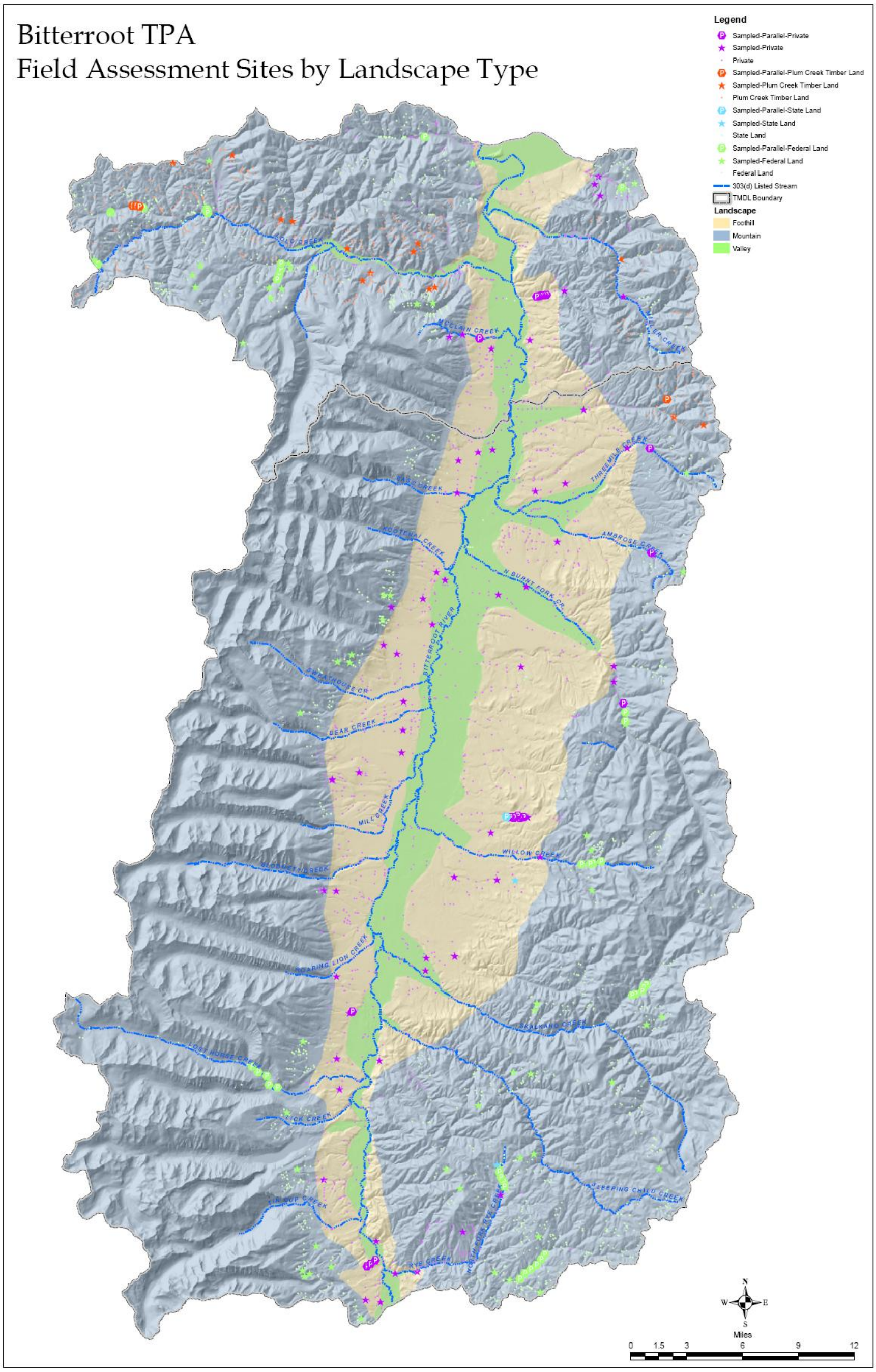


**Figure G6-2. Bitterroot TPA Field Assessment Sites by Landscape Type.**


**Figure G6-3. Bitterroot TPA Field Assessment Sites by 6th Code HUC/303(d) Stream.**

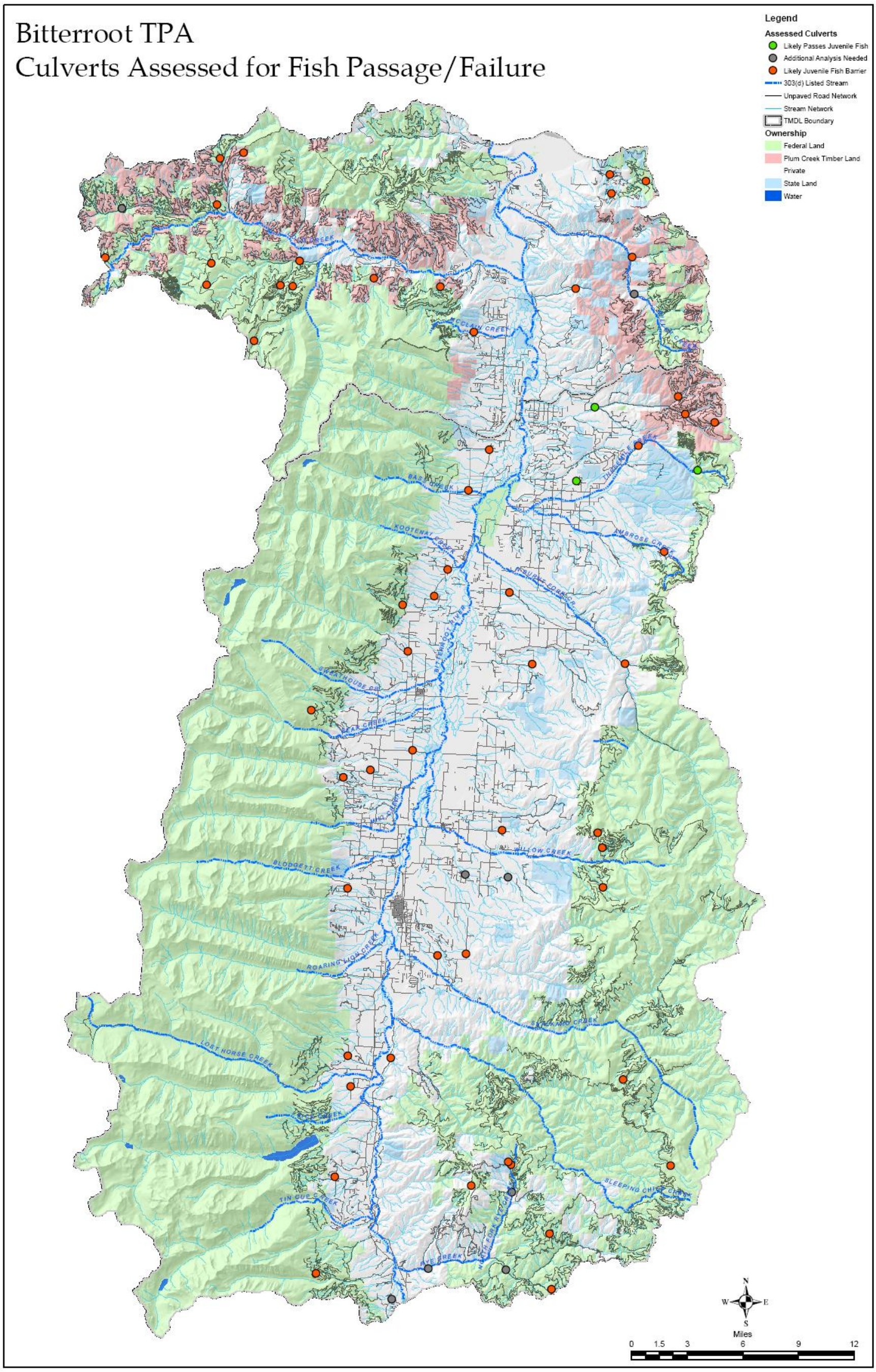


**Figure G6-4. Bitterroot TPA Culverts Assessed for Fish Passage/Failure.**

# G7.0 TABLES

**Table G1-1. 2010 303(d) Listed Stream Segments – Bitterroot TPA**

| Waterbody | Waterbody Segment ID | 2010 Impairment Listing |
|---|---|---|
| AMBROSE CREEK | MT76H004_120 | Other habitat alterations |
| BASS CREEK | MT76H004_010 | Other habitat alterations |
| BEAR CREEK | MT76H004_030 | Other habitat alterations |
| BLODGETT CREEK | MT76H004_050 | Other habitat alterations |
| KOOTENAI CREEK | MT76H004_020 | Other habitat alterations |
| LICK CREEK | MT76H004_170 | Sediment/Siltation, Other habitat alterations |
| LOLO CREEK | MT76H005_013 | Sediment/Siltation, Other habitat alterations |
| LOLO CREEK | MT76H005_011 | Sediment/Siltation, Other habitat alterations |
| LOLO CREEK | MT76H005_012 | Sediment/Siltation, Other habitat alterations |
| LOST HORSE CREEK | MT76H004_070 | Other habitat alterations |
| McCLAIN CREEK | MT76H004_150 | Sedimentation/Siltation |
| MILL CREEK | MT76H004_040 | Other habitat alterations |
| MILLER CREEK | MT76H004_130 | Sediment/Siltation, Other habitat alterations |
| MUDDY SPRING CREEK | MT76H004_180 | Sedimentation/Siltation |
| NORTH BURNT FORK CREEK | MT76H004_200 | Bottom Deposits |
| NORTH FORK RYE CREEK | MT76H004_160 | Other habitat alterations |
| RYE CREEK | MT76H004_190 | Sediment/Siltation, Other habitat alterations |
| SKALKAHO CREEK | MT76H004_100 | Other habitat alterations |
| SLEEPING CHILD CREEK | MT76H004_090 | Sedimentation/Siltation |
| SOUTH FORK LOLO CREEK | MT76H005_020 | Other habitat alterations |
| SWEATHOUSE CREEK | MT76H004_210 | Other habitat alterations |
| THREEMILE CREEK | MT76H004_140 | Sediment/Siltation, Other habitat alterations |
| TIN CUP CREEK | MT76H004_080 | Other habitat alterations |
| WILLOW CREEK | MT76H004_110 | Sediment/Siltation, Other habitat alterations |

**Table G2-5. Unpaved Road Summary by 6th Code HUC/303(d) Watershed**

| Subwatershed | Unpaved Crossings | Unpaved Roads (miles) | Stream Length (miles) | Unpaved Roads w/in 50ft (miles) | Unpaved Roads w/in 100ft (miles) | Area (sq miles) | Crossing Density (#/sq mi) | Road Density (mi/sq mi) |
|---|---|---|---|---|---|---|---|---|
| Ambrose Creek | 59 | 64.19 | 59.72 | 2.40 | 7.56 | 20.70 | 2.85 | 3.10 |
| Bass Creek | 12 | 6.32 | 31.72 | 0.25 | 0.53 | 14.45 | 0.83 | 0.44 |
| Bear Creek | 10 | 11.86 | 32.72 | 0.50 | 1.12 | 27.91 | 0.36 | 0.43 |
| Big Creek | 1 | 5.55 | 54.33 | 0.02 | 0.04 | 35.11 | 0.03 | 0.16 |
| Bitterroot River-Birch Creek | 91 | 106.19 | 138.57 | 3.66 | 9.06 | 59.61 | 1.53 | 1.78 |
| Lower Bear Creek | 8 | 5.49 | 8.92 | 0.18 | 0.50 | 1.96 | 4.09 | 2.81 |
| Bitterroot River-Canyon Creek | 21 | 30.39 | 39.76 | 0.51 | 1.55 | 15.56 | 1.35 | 1.95 |
| Bitterroot River-Chaffin Creek | 46 | 51.68 | 40.79 | 1.79 | 4.18 | 20.20 | 2.28 | 2.56 |
| Bitterroot River-Darby | 120 | 97.33 | 129.45 | 4.68 | 12.49 | 48.29 | 2.48 | 2.02 |
| Bitterroot River-Hayes Creek | 147 | 119.23 | 121.27 | 6.50 | 13.74 | 49.67 | 2.96 | 2.40 |
| Bitterroot River-Larry Creek | 121 | 105.09 | 160.89 | 3.89 | 8.39 | 50.49 | 2.40 | 2.08 |
| Bitterroot River-Lick Creek | 73 | 74.75 | 104.74 | 2.07 | 5.40 | 44.61 | 1.64 | 1.68 |
| Lick Creek | 27 | 25.24 | 23.84 | 0.98 | 2.45 | 8.53 | 3.17 | 2.96 |
| Bitterroot River-North Woodchuck Creek | 86 | 72.69 | 139.60 | 4.54 | 11.96 | 47.40 | 1.81 | 1.53 |
| McClain Creek | 44 | 41.11 | 29.38 | 1.56 | 3.27 | 8.94 | 4.92 | 4.60 |
| Bitterroot River-Spooner Creek | 65 | 69.33 | 111.88 | 1.65 | 4.63 | 39.08 | 1.66 | 1.77 |
| Bitterroot River-Woodside | 71 | 122.50 | 125.74 | 2.45 | 6.08 | 51.54 | 1.38 | 2.38 |
| Blodgett Creek | 4 | 6.00 | 37.66 | 0.10 | 0.26 | 28.35 | 0.14 | 0.21 |
| Burnt Fork Bitterroot River-Stevensville | 53 | 70.53 | 93.89 | 2.01 | 5.60 | 32.99 | 1.61 | 2.14 |
| Daly Creek | 30 | 48.18 | 68.91 | 1.01 | 2.94 | 37.38 | 0.80 | 1.29 |
| Divide Creek | 16 | 15.17 | 46.88 | 0.38 | 0.93 | 17.82 | 0.90 | 0.85 |
| Eightmile Creek | 78 | 127.51 | 53.58 | 5.00 | 13.84 | 27.62 | 2.82 | 4.62 |
| Fred Burr Creek | 14 | 14.21 | 35.94 | 0.39 | 0.84 | 24.00 | 0.58 | 0.59 |
| Gird Creek | 20 | 36.69 | 73.61 | 0.71 | 1.62 | 32.36 | 0.62 | 1.13 |
| Howard Creek | 101 | 125.00 | 49.38 | 6.38 | 16.18 | 19.35 | 5.22 | 6.46 |
| Kootenai Creek | 7 | 5.61 | 66.61 | 0.27 | 0.51 | 31.49 | 0.22 | 0.18 |
| Little Sleeping Child Creek | 27 | 32.71 | 37.64 | 1.12 | 3.72 | 15.51 | 1.74 | 2.11 |
| Lolo Creek-Grave Creek | 194 | 246.74 | 130.57 | 11.28 | 25.12 | 55.76 | 3.48 | 4.42 |
| Lost Horse Creek | 13 | 14.84 | 47.14 | 0.48 | 1.66 | 43.41 | 0.30 | 0.34 |
| South Lost Horse Creek | 31 | 27.81 | 43.43 | 1.43 | 2.33 | 31.17 | 0.99 | 0.89 |
| Lower Burnt Fork Bitterroot River | 41 | 59.34 | 61.29 | 2.34 | 5.40 | 31.31 | 1.31 | 1.90 |

**Table G2-5. Unpaved Road Summary by 6th Code HUC/303(d) Watershed**

| Subwatershed | Unpaved Crossings | Unpaved Roads (miles) | Stream Length (miles) | Unpaved Roads w/in 50ft (miles) | Unpaved Roads w/in 100ft (miles) | Area (sq miles) | Crossing Density (#/sq mi) | Road Density (mi/sq mi) |
|---|---|---|---|---|---|---|---|---|
| Muddy Spring Creek | 1 | 5.57 | 2.61 | 0.02 | 0.03 | 1.71 | 0.58 | 3.25 |
| Lower Lolo Creek | 295 | 220.98 | 129.45 | 12.85 | 24.24 | 49.65 | 5.94 | 4.45 |
| Upper Lolo Creek | 91 | 126.34 | 53.30 | 4.13 | 9.25 | 21.99 | 4.14 | 5.75 |
| South Fork Lolo Creek | 29 | 55.40 | 61.40 | 0.92 | 2.96 | 38.82 | 0.75 | 1.43 |
| Lower Rye Creek | 60 | 51.49 | 42.27 | 4.35 | 10.19 | 16.09 | 3.73 | 3.20 |
| Upper Rye Creek | 151 | 121.30 | 78.27 | 7.01 | 16.10 | 28.50 | 5.30 | 4.26 |
| North Fork Rye Creek | 65 | 67.51 | 46.82 | 2.69 | 6.79 | 18.37 | 3.54 | 3.67 |
| Lower Skalkaho Creek | 18 | 19.73 | 47.47 | 0.74 | 1.63 | 16.34 | 1.10 | 1.21 |
| Middle Skalkaho Creek | 27 | 36.62 | 41.64 | 1.22 | 2.37 | 18.38 | 1.47 | 1.99 |
| Upper Skalkaho Creek | 46 | 66.51 | 101.08 | 1.44 | 4.93 | 45.27 | 1.02 | 1.47 |
| Lower Sleeping Child Creek | 44 | 47.62 | 48.32 | 1.82 | 3.66 | 20.57 | 2.14 | 2.32 |
| Middle Sleeping Child Creek | 25 | 45.31 | 58.40 | 1.14 | 2.17 | 22.43 | 1.11 | 2.02 |
| Upper Sleeping Child Creek | 51 | 51.03 | 39.83 | 1.73 | 3.95 | 15.44 | 3.30 | 3.31 |
| McCalla Creek | 56 | 43.18 | 47.46 | 1.59 | 3.46 | 17.10 | 3.28 | 2.53 |
| Mill Creek | 58 | 58.09 | 75.53 | 1.72 | 4.51 | 39.98 | 1.45 | 1.45 |
| Miller Creek | 118 | 167.55 | 106.74 | 5.82 | 14.16 | 47.83 | 2.47 | 3.50 |
| O'Brien Creek | 99 | 104.74 | 61.90 | 4.99 | 9.74 | 25.33 | 3.91 | 4.13 |
| Roaring Lion Creek | 5 | 3.15 | 43.97 | 0.13 | 0.24 | 25.14 | 0.20 | 0.13 |
| Rock Creek | 7 | 16.35 | 64.82 | 0.15 | 0.49 | 57.29 | 0.12 | 0.29 |
| Sawtooth Creek | 22 | 14.06 | 69.73 | 0.59 | 1.28 | 30.38 | 0.72 | 0.46 |
| Swan Creek | 30 | 29.75 | 71.74 | 0.75 | 2.04 | 28.63 | 1.05 | 1.04 |
| Sweathouse Creek | 50 | 63.32 | 56.36 | 1.37 | 3.47 | 28.52 | 1.75 | 2.22 |
| Sweeney Creek | 19 | 13.95 | 36.36 | 0.56 | 1.27 | 19.00 | 1.00 | 0.73 |
| Threemile Creek | 97 | 126.46 | 136.93 | 4.37 | 12.96 | 51.87 | 1.87 | 2.44 |
| Tin Cup Creek | 29 | 19.62 | 60.69 | 0.77 | 1.63 | 42.23 | 0.69 | 0.46 |
| Upper Burnt Fork Bitterroot River | 19 | 19.61 | 72.01 | 0.55 | 1.90 | 40.03 | 0.47 | 0.49 |
| West Fork Butte Creek | 50 | 98.92 | 35.52 | 1.53 | 5.88 | 17.86 | 2.80 | 5.54 |
| Willoughby Creek | 35 | 38.37 | 53.11 | 2.45 | 5.48 | 20.73 | 1.69 | 1.85 |
| Willow Creek | 66 | 95.10 | 94.04 | 3.02 | 8.90 | 42.33 | 1.56 | 2.25 |
| **Total** | **3294** | **3666.92** | **4037.60** | **140.98** | **339.56** | **1820.41** | **1.81** | **2.01** |

Bear Creek and Sweathouse Creek HUC_12 layers were cross-labeled. They have been corrected in this spreadsheet.

**Table G2-6. Unpaved Road Crossings by Ownership and Landscape Type by 6th Code HUC/303(d) Subwatershed**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subwatershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Crossings |
| Ambrose Creek | 0 | 2 | 20 | 0 | 0 | 0 | 18 | 17 | 2 | 0 | 0 | 0 | 59 |
| Bass Creek | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 12 |
| Bear Creek | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 10 |
| Big Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| Bitterroot River-Birch Creek | 0 | 0 | 6 | 0 | 0 | 0 | 14 | 66 | 4 | 0 | 1 | 0 | 91 |
| Bitterroot River-Canyon Creek | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 9 | 0 | 0 | 0 | 0 | 21 |
| Bitterroot River-Chaffin Creek | 0 | 1 | 32 | 0 | 0 | 0 | 4 | 9 | 0 | 0 | 0 | 0 | 46 |
| Bitterroot River-Darby | 0 | 0 | 55 | 0 | 0 | 0 | 14 | 50 | 1 | 0 | 0 | 0 | 120 |
| Bitterroot River-Hayes Creek | 0 | 1 | 66 | 0 | 0 | 10 | 5 | 25 | 30 | 0 | 0 | 10 | 147 |
| Bitterroot River-Larry Creek | 1 | 3 | 10 | 0 | 0 | 0 | 35 | 72 | 0 | 0 | 0 | 0 | 121 |
| Bitterroot River-Lick Creek | 0 | 3 | 18 | 0 | 0 | 0 | 12 | 36 | 4 | 0 | 0 | 0 | 73 |
| Bitterroot River-North Woodchuck Creek | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 42 | 18 | 5 | 1 | 3 | 86 |
| Bitterroot River-Spooner Creek | 0 | 1 | 19 | 0 | 0 | 0 | 15 | 28 | 2 | 0 | 0 | 0 | 65 |
| Bitterroot River-Woodside | 0 | 0 | 2 | 0 | 0 | 0 | 15 | 48 | 6 | 0 | 0 | 0 | 71 |
| Blodgett Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 4 |
| Burnt Fork Bitterroot River-Stevensville | 3 | 0 | 5 | 0 | 0 | 0 | 39 | 6 | 0 | 0 | 0 | 0 | 53 |
| Daly Creek | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| Divide Creek | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| Eightmile Creek | 0 | 0 | 0 | 0 | 0 | 52 | 5 | 14 | 7 | 0 | 0 | 0 | 78 |
| Fred Burr Creek | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 9 | 4 | 0 | 0 | 0 | 14 |
| Gird Creek | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 20 |
| Howard Creek | 0 | 0 | 47 | 0 | 0 | 54 | 0 | 0 | 0 | 0 | 0 | 0 | 101 |
| Kootenai Creek | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 7 |
| Lick Creek | 0 | 0 | 25 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 27 |
| Little Sleeping Child Creek | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 27 |
| Lolo Creek-Grave Creek | 0 | 0 | 64 | 0 | 0 | 111 | 1 | 0 | 16 | 0 | 0 | 2 | 194 |
| Lost Horse Creek | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Lower Bear Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 8 |
| Lower Burnt Fork Bitterroot River | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 3 | 7 | 0 | 0 | 1 | 41 |
| Lower Lolo Creek | 0 | 0 | 91 | 0 | 0 | 147 | 20 | 2 | 35 | 0 | 0 | 0 | 295 |
| Lower Rye Creek | 0 | 0 | 10 | 0 | 0 | 0 | 2 | 6 | 42 | 0 | 0 | 0 | 60 |
| Lower Skalkaho Creek | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 | 0 | 0 | 0 | 0 | 18 |
| Lower Sleeping Child Creek | 0 | 0 | 39 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 44 |
| McCalla Creek | 0 | 0 | 34 | 0 | 0 | 0 | 4 | 17 | 1 | 0 | 0 | 0 | 56 |
| McClain Creek | 0 | 0 | 16 | 0 | 0 | 0 | 3 | 15 | 10 | 0 | 0 | 0 | 44 |
| Middle Skalkaho Creek | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 |
| Middle Sleeping Child Creek | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Mill Creek | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 48 | 3 | 0 | 0 | 0 | 58 |
| Miller Creek | 0 | 0 | 44 | 0 | 0 | 39 | 5 | 1 | 23 | 0 | 0 | 6 | 118 |
| Muddy Spring Creek | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| North Fork Rye Creek | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 2 | 65 |
| O'Brien Creek | 0 | 0 | 64 | 0 | 0 | 2 | 2 | 2 | 29 | 0 | 0 | 0 | 99 |
| Roaring Lion Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 5 |
| Rock Creek | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 7 |
| Sawtooth Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 4 | 0 | 0 | 0 | 22 |
| South Fork Lolo Creek | 0 | 0 | 18 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| South Lost Horse Creek | 0 | 1 | 25 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 31 |

**Table G2-6. Unpaved Road Crossings by Ownership and Landscape Type by 6th Code HUC/303(d) Subwatershed**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subwatershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Crossings |
| Swan Creek | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 22 | 1 | 0 | 0 | 0 | 30 |
| Sweathouse Creek | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 50 |
| Sweeney Creek | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 19 |
| Threemile Creek | 0 | 0 | 25 | 0 | 1 | 2 | 15 | 47 | 2 | 0 | 0 | 5 | 97 |
| Tin Cup Creek | 0 | 0 | 22 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 29 |
| Upper Burnt Fork Bitterroot River | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| Upper Lolo Creek | 0 | 0 | 54 | 0 | 0 | 36 | 0 | 0 | 1 | 0 | 0 | 0 | 91 |
| Upper Rye Creek | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 151 |
| Upper Skalkaho Creek | 0 | 0 | 46 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 46 |
| Upper Sleeping Child Creek | 0 | 0 | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| West Fork Butte Creek | 0 | 0 | 40 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 50 |
| Willoughby Creek | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 24 | 5 | 0 | 4 | 0 | 35 |
| Willow Creek | 0 | 0 | 38 | 0 | 0 | 0 | 5 | 19 | 3 | 0 | 1 | 0 | 66 |
| **Total** | **4** | **12** | **1455** | **0** | **1** | **474** | **286** | **741** | **280** | **5** | **7** | **29** | **3294** |

**Table G2-7. Detailed Length of Parallel Road Segments Within 50-Feet of Streams by 6th Code HUC/303(d) Subwatershed**

| Ownership | Federal Land | | | Plum Creek Timber Land | | | Private Land | | | State Land | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subwatershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | (miles) |
| Ambrose Creek | 0.00 | 0.34 | 0.95 | 0.00 | 0.00 | 0.00 | 0.42 | 0.57 | 0.12 | 0.00 | 0.00 | 0.00 | 2.40 |
| Bass Creek | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 |
| Bear Creek | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 |
| Big Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| Bitterroot River-Birch Creek | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.44 | 2.72 | 0.28 | 0.00 | 0.05 | 0.00 | 3.66 |
| Bitterroot River-Canyon Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.31 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.51 |
| Bitterroot River-Chaffin Creek | 0.00 | 0.03 | 1.26 | 0.00 | 0.00 | 0.00 | 0.18 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 1.79 |
| Bitterroot River-Darby | 0.00 | 0.00 | 1.87 | 0.00 | 0.00 | 0.00 | 0.37 | 2.26 | 0.18 | 0.00 | 0.00 | 0.00 | 4.68 |
| Bitterroot River-Hayes Creek | 0.00 | 0.02 | 3.24 | 0.00 | 0.00 | 0.37 | 0.14 | 0.82 | 1.38 | 0.00 | 0.00 | 0.52 | 6.50 |
| Bitterroot River-Larry Creek | 0.10 | 0.07 | 0.24 | 0.00 | 0.00 | 0.00 | 0.93 | 2.54 | 0.00 | 0.00 | 0.00 | 0.00 | 3.89 |
| Bitterroot River-Lick Creek | 0.00 | 0.12 | 0.45 | 0.00 | 0.00 | 0.00 | 0.26 | 1.13 | 0.11 | 0.00 | 0.00 | 0.00 | 2.07 |
| Bitterroot River-North Woodchuck Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.49 | 2.04 | 1.66 | 0.11 | 0.03 | 0.19 | 4.54 |
| Bitterroot River-Spooner Creek | 0.00 | 0.02 | 0.43 | 0.00 | 0.00 | 0.00 | 0.37 | 0.78 | 0.05 | 0.00 | 0.00 | 0.00 | 1.65 |
| Bitterroot River-Woodside | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.33 | 1.95 | 0.14 | 0.00 | 0.00 | 0.00 | 2.45 |
| Blodgett Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 |
| Burnt Fork Bitterroot River-Stevensville | 0.08 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 1.40 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 2.01 |
| Daly Creek | 0.00 | 0.00 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.01 |
| Divide Creek | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 |
| Eightmile Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.51 | 0.13 | 1.07 | 0.30 | 0.00 | 0.00 | 0.00 | 5.00 |
| Fred Burr Creek | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.12 | 0.00 | 0.00 | 0.00 | 0.39 |
| Gird Creek | 0.00 | 0.00 | 0.57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.71 |
| Howard Creek | 0.00 | 0.00 | 2.51 | 0.00 | 0.00 | 3.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 6.38 |
| Kootenai Creek | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.27 |
| Lick Creek | 0.00 | 0.00 | 0.93 | 0.00 | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.98 |
| Little Sleeping Child Creek | 0.00 | 0.00 | 0.53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.59 | 0.00 | 0.00 | 0.00 | 1.12 |
| Lolo Creek-Grave Creek | 0.00 | 0.00 | 4.07 | 0.00 | 0.00 | 6.35 | 0.09 | 0.00 | 0.68 | 0.00 | 0.00 | 0.08 | 11.28 |
| Lost Horse Creek | 0.00 | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.48 |
| Lower Bear Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 |
| Lower Burnt Fork Bitterroot River | 0.00 | 0.00 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.91 | 0.00 | 0.00 | 0.13 | 2.34 |

**Table G2-7. Detailed Length of Parallel Road Segments Within 50-Feet of Streams by 6th Code HUC/303(d) Subwatershed**

| Ownership | Federal Land | | | Plum Creek Timber Land | | | Private Land | | | State Land | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subwatershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | (miles) |
| Lower Lolo Creek | 0.00 | 0.00 | 3.02 | 0.00 | 0.00 | 6.88 | 0.48 | 0.04 | 2.42 | 0.00 | 0.00 | 0.00 | 12.85 |
| Lower Rye Creek | 0.00 | 0.00 | 0.29 | 0.00 | 0.00 | 0.00 | 0.05 | 0.27 | 3.74 | 0.00 | 0.00 | 0.00 | 4.35 |
| Lower Skalkaho Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.74 |
| Lower Sleeping Child Creek | 0.00 | 0.00 | 1.69 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.09 | 0.00 | 0.00 | 0.00 | 1.82 |
| McCalla Creek | 0.00 | 0.00 | 0.87 | 0.00 | 0.00 | 0.00 | 0.09 | 0.55 | 0.09 | 0.00 | 0.00 | 0.00 | 1.59 |
| McClain Creek | 0.00 | 0.00 | 0.68 | 0.00 | 0.00 | 0.00 | 0.12 | 0.48 | 0.29 | 0.00 | 0.00 | 0.00 | 1.56 |
| Middle Skalkaho Creek | 0.00 | 0.00 | 1.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.22 |
| Middle Sleeping Child Creek | 0.00 | 0.00 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.14 |
| Mill Creek | 0.00 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 1.39 | 0.12 | 0.00 | 0.00 | 0.00 | 1.72 |
| Miller Creek | 0.00 | 0.00 | 2.50 | 0.00 | 0.00 | 1.46 | 0.12 | 0.02 | 1.49 | 0.00 | 0.00 | 0.23 | 5.82 |
| Muddy Spring Creek | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| North Fork Rye Creek | 0.00 | 0.00 | 2.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 | 0.00 | 0.08 | 2.69 |
| O'Brien Creek | 0.00 | 0.00 | 3.21 | 0.00 | 0.00 | 0.05 | 0.10 | 0.12 | 1.51 | 0.00 | 0.00 | 0.00 | 4.99 |
| Roaring Lion Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 |
| Rock Creek | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.06 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| Sawtooth Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.46 | 0.13 | 0.00 | 0.00 | 0.00 | 0.59 |
| South Fork Lolo Creek | 0.00 | 0.00 | 0.57 | 0.00 | 0.00 | 0.35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.92 |
| South Lost Horse Creek | 0.00 | 0.02 | 1.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.04 | 0.00 | 0.00 | 0.00 | 1.43 |
| Swan Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.58 | 0.02 | 0.00 | 0.00 | 0.00 | 0.75 |
| Sweathouse Creek | 0.00 | 0.00 | 0.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.55 | 0.00 | 0.00 | 0.00 | 0.00 | 1.37 |
| Sweeney Creek | 0.00 | 0.00 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.56 |
| Threemile Creek | 0.00 | 0.00 | 1.17 | 0.00 | 0.14 | 0.23 | 0.47 | 1.60 | 0.16 | 0.00 | 0.00 | 0.60 | 4.37 |
| Tin Cup Creek | 0.00 | 0.00 | 0.52 | 0.00 | 0.00 | 0.00 | 0.02 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.77 |
| Upper Burnt Fork Bitterroot River | 0.00 | 0.00 | 0.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.55 |
| Upper Lolo Creek | 0.00 | 0.00 | 2.49 | 0.00 | 0.00 | 1.62 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 4.13 |
| Upper Rye Creek | 0.00 | 0.00 | 6.86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 7.01 |
| Upper Skalkaho Creek | 0.00 | 0.00 | 1.44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.44 |
| Upper Sleeping Child Creek | 0.00 | 0.00 | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.73 |
| West Fork Butte Creek | 0.00 | 0.00 | 1.17 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.53 |
| Willoughby Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 1.77 | 0.49 | 0.00 | 0.13 | 0.00 | 2.45 |
| Willow Creek | 0.00 | 0.00 | 1.86 | 0.00 | 0.00 | 0.00 | 0.10 | 0.83 | 0.23 | 0.00 | 0.00 | 0.00 | 3.02 |
| **Total** | **0.18** | **0.62** | **58.89** | **0.00** | **0.14** | **25.07** | **8.00** | **28.09** | **17.85** | **0.11** | **0.21** | **1.82** | **140.98** |

**Table G3-2. Detailed Sediment Load From Unpaved Road Crossings by 6th Code HUC/303(d) Subwatershed – Existing Conditions**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load (t/y) |
| Ambrose Creek | 0 | 0.44 | 2.4 | 0 | 0 | 0 | 1.26 | 3.74 | 0.24 | 0 | 0 | 0 | 8.08 |
| Bass Creek | 0 | 0 | 0.96 | 0 | 0 | 0 | 0 | 0.88 | 0 | 0 | 0 | 0 | 1.84 |
| Bear Creek | 0 | 0 | 0.6 | 0 | 0 | 0 | 0 | 1.1 | 0 | 0 | 0 | 0 | 1.7 |
| Big Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.22 | 0 | 0 | 0 | 0 | 0.22 |
| Bitterroot River-Birch Creek | 0 | 0 | 0.72 | 0 | 0 | 0 | 0.98 | 14.52 | 0.48 | 0 | 0.22 | 0 | 16.92 |
| Bitterroot River-Canyon Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0.84 | 1.98 | 0 | 0 | 0 | 0 | 2.82 |
| Bitterroot River-Chaffin Creek | 0 | 0.22 | 3.84 | 0 | 0 | 0 | 0.28 | 1.98 | 0 | 0 | 0 | 0 | 6.32 |
| Bitterroot River-Darby | 0 | 0 | 6.6 | 0 | 0 | 0 | 0.98 | 11 | 0.12 | 0 | 0 | 0 | 18.7 |
| Bitterroot River-Hayes Creek | 0 | 0.22 | 7.92 | 0 | 0 | 1.2 | 0.35 | 5.5 | 3.6 | 0 | 0 | 1.2 | 19.99 |
| Bitterroot River-Larry Creek | 0.07 | 0.66 | 1.2 | 0 | 0 | 0 | 2.45 | 15.84 | 0 | 0 | 0 | 0 | 20.22 |
| Bitterroot River-Lick Creek | 0 | 0.66 | 2.16 | 0 | 0 | 0 | 0.84 | 7.92 | 0.48 | 0 | 0 | 0 | 12.06 |
| Bitterroot River-North Woodchuck Creek | 0 | 0 | 0 | 0 | 0 | 0 | 1.19 | 9.24 | 2.16 | 5 | 0.22 | 0.36 | 18.17 |
| Bitterroot River-Spooner Creek | 0 | 0.22 | 2.28 | 0 | 0 | 0 | 1.05 | 6.16 | 0.24 | 0 | 0 | 0 | 9.95 |
| Bitterroot River-Woodside | 0 | 0 | 0.24 | 0 | 0 | 0 | 1.05 | 10.56 | 0.72 | 0 | 0 | 0 | 12.57 |
| Blodgett Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.88 | 0 | 0 | 0 | 0 | 0.88 |
| Burnt Fork Bitterroot River-Stevensville | 0.21 | 0 | 0.6 | 0 | 0 | 0 | 2.73 | 1.32 | 0 | 0 | 0 | 0 | 4.86 |
| Daly Creek | 0 | 0 | 3.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.6 |
| Divide Creek | 0 | 0 | 1.92 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.92 |
| Eightmile Creek | 0 | 0 | 0 | 0 | 0 | 6.24 | 0.35 | 3.08 | 0.84 | 0 | 0 | 0 | 10.51 |
| Fred Burr Creek | 0 | 0 | 0.12 | 0 | 0 | 0 | 0 | 1.98 | 0.48 | 0 | 0 | 0 | 2.58 |
| Gird Creek | 0 | 0 | 1.8 | 0 | 0 | 0 | 0 | 1.1 | 0 | 0 | 0 | 0 | 2.9 |
| Howard Creek | 0 | 0 | 5.64 | 0 | 0 | 6.48 | 0 | 0 | 0 | 0 | 0 | 0 | 12.12 |
| Kootenai Creek | 0 | 0 | 0.24 | 0 | 0 | 0 | 0 | 1.1 | 0 | 0 | 0 | 0 | 1.34 |
| Lick Creek | 0 | 0 | 3 | 0 | 0 | 0 | 0.07 | 0.22 | 0 | 0 | 0 | 0 | 3.29 |
| Little Sleeping Child Creek | 0 | 0 | 2.04 | 0 | 0 | 0 | 0 | 0 | 1.2 | 0 | 0 | 0 | 3.24 |
| Lolo Creek-Grave Creek | 0 | 0 | 7.68 | 0 | 0 | 13.32 | 0.07 | 0 | 1.92 | 0 | 0 | 0.24 | 23.23 |
| Lost Horse Creek | 0 | 0 | 1.56 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.56 |
| Lower Bear Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.76 | 0 | 0 | 0 | 0 | 1.76 |
| Lower Burnt Fork Bitterroot River | 0 | 0 | 3.6 | 0 | 0 | 0 | 0 | 0.66 | 0.84 | 0 | 0 | 0.12 | 5.22 |
| Lower Lolo Creek | 0 | 0 | 10.92 | 0 | 0 | 17.64 | 1.4 | 0.44 | 4.2 | 0 | 0 | 0 | 34.6 |
| Lower Rye Creek | 0 | 0 | 1.2 | 0 | 0 | 0 | 0.14 | 1.32 | 5.04 | 0 | 0 | 0 | 7.7 |
| Lower Skalkaho Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0.63 | 1.98 | 0 | 0 | 0 | 0 | 2.61 |
| Lower Sleeping Child Creek | 0 | 0 | 4.68 | 0 | 0 | 0 | 0.07 | 0.66 | 0.12 | 0 | 0 | 0 | 5.53 |
| McCalla Creek | 0 | 0 | 4.08 | 0 | 0 | 0 | 0.28 | 3.74 | 0.12 | 0 | 0 | 0 | 8.22 |
| McClain Creek | 0 | 0 | 1.92 | 0 | 0 | 0 | 0.21 | 3.3 | 1.2 | 0 | 0 | 0 | 6.63 |
| Middle Skalkaho Creek | 0 | 0 | 3.24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.24 |
| Middle Sleeping Child Creek | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Mill Creek | 0 | 0 | 0.84 | 0 | 0 | 0 | 0 | 10.56 | 0.36 | 0 | 0 | 0 | 11.76 |
| Miller Creek | 0 | 0 | 5.28 | 0 | 0 | 4.68 | 0.35 | 0.22 | 2.76 | 0 | 0 | 0.72 | 14.01 |
| Muddy Spring Creek | 0 | 0 | 0.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 |
| North Fork Rye Creek | 0 | 0 | 6.84 | 0 | 0 | 0 | 0 | 0 | 0.72 | 0 | 0 | 0.24 | 7.8 |
| O'Brien Creek | 0 | 0 | 7.68 | 0 | 0 | 0.24 | 0.14 | 0.44 | 3.48 | 0 | 0 | 0 | 11.98 |
| Roaring Lion Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.1 | 0 | 0 | 0 | 0 | 1.1 |
| Rock Creek | 0 | 0 | 0.36 | 0 | 0 | 0 | 0.21 | 0.22 | 0 | 0 | 0 | 0 | 0.79 |
| Sawtooth Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.96 | 0.48 | 0 | 0 | 0 | 4.44 |

**Table G3-2. Detailed Sediment Load From Unpaved Road Crossings by 6th Code HUC/303(d) Subwatershed – Existing Conditions**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load (t/y) |
| South Fork Lolo Creek | 0 | 0 | 2.16 | 0 | 0 | 1.32 | 0 | 0 | 0 | 0 | 0 | 0 | 3.48 |
| South Lost Horse Creek | 0 | 0.22 | 3 | 0 | 0 | 0 | 0 | 0.66 | 0.24 | 0 | 0 | 0 | 4.12 |
| Swan Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0.49 | 4.84 | 0.12 | 0 | 0 | 0 | 5.45 |
| Sweathouse Creek | 0 | 0 | 3.6 | 0 | 0 | 0 | 0 | 4.4 | 0 | 0 | 0 | 0 | 8 |
| Sweeney Creek | 0 | 0 | 1.56 | 0 | 0 | 0 | 0 | 1.32 | 0 | 0 | 0 | 0 | 2.88 |
| Threemile Creek | 0 | 0 | 3 | 0 | 0.22 | 0.24 | 1.05 | 10.34 | 0.24 | 0 | 0 | 0.6 | 15.69 |
| Tin Cup Creek | 0 | 0 | 2.64 | 0 | 0 | 0 | 0.07 | 1.32 | 0 | 0 | 0 | 0 | 4.03 |
| Upper Burnt Fork Bitterroot River | 0 | 0 | 2.28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.28 |
| Upper Lolo Creek | 0 | 0 | 6.48 | 0 | 0 | 4.32 | 0 | 0 | 0.12 | 0 | 0 | 0 | 10.92 |
| Upper Rye Creek | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0.12 | 0 | 0 | 0 | 18.12 |
| Upper Skalkaho Creek | 0 | 0 | 5.52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.52 |
| Upper Sleeping Child Creek | 0 | 0 | 6.12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.12 |
| West Fork Butte Creek | 0 | 0 | 4.8 | 0 | 0 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Willoughby Creek | 0 | 0 | 0 | 0 | 0 | 0 | 0.14 | 5.28 | 0.6 | 0 | 0.88 | 0 | 6.9 |
| Willow Creek | 0 | 0 | 4.56 | 0 | 0 | 0 | 0.35 | 4.18 | 0.36 | 0 | 0.22 | 0 | 9.67 |
| **Total** | **0.28** | **2.64** | **174.6** | **0** | **0.22** | **56.88** | **20.02** | **163.02** | **33.6** | **5** | **1.54** | **3.48** | **461.28** |

**Table G3-3. Detailed Sediment Load from Unpaved Parallel Road Segments 6th Code by HUC/303(d) Subwatershed – Existing Conditions**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load |
| Ambrose Creek | 0.00 | 0.10 | 2.10 | 0.00 | 0.00 | 0.00 | 0.53 | 0.18 | 0.27 | 0.00 | 0.00 | 0.00 | 3.18 |
| Bass Creek | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.41 |
| Bear Creek | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.41 |
| Big Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| Bitterroot River-Birch Creek | 0.00 | 0.00 | 0.37 | 0.00 | 0.00 | 0.00 | 0.56 | 0.84 | 0.61 | 0.00 | 0.02 | 0.00 | 2.40 |
| Bitterroot River-Canyon Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.39 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45 |
| Bitterroot River-Chaffin Creek | 0.00 | 0.01 | 2.79 | 0.00 | 0.00 | 0.00 | 0.22 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 3.12 |
| Bitterroot River-Darby | 0.00 | 0.00 | 4.14 | 0.00 | 0.00 | 0.00 | 0.46 | 0.70 | 0.39 | 0.00 | 0.00 | 0.00 | 5.69 |
| Bitterroot River-Hayes Creek | 0.00 | 0.01 | 7.16 | 0.00 | 0.00 | 0.82 | 0.18 | 0.25 | 3.06 | 0.00 | 0.00 | 1.15 | 12.63 |
| Bitterroot River-Larry Creek | 0.13 | 0.02 | 0.54 | 0.00 | 0.00 | 0.00 | 1.18 | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 2.65 |
| Bitterroot River-Lick Creek | 0.00 | 0.04 | 0.99 | 0.00 | 0.00 | 0.00 | 0.33 | 0.35 | 0.25 | 0.00 | 0.00 | 0.00 | 1.95 |
| Bitterroot River-North Woodchuck Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.62 | 0.63 | 3.66 | 0.13 | 0.01 | 0.41 | 5.53 |
| Bitterroot River-Spooner Creek | 0.00 | 0.01 | 0.94 | 0.00 | 0.00 | 0.00 | 0.47 | 0.24 | 0.10 | 0.00 | 0.00 | 0.00 | 1.76 |
| Bitterroot River-Woodside | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.41 | 0.60 | 0.30 | 0.00 | 0.00 | 0.00 | 1.41 |
| Blodgett Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| Burnt Fork Bitterroot River-Stevensville | 0.10 | 0.00 | 0.41 | 0.00 | 0.00 | 0.00 | 1.77 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 2.38 |
| Daly Creek | 0.00 | 0.00 | 2.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.23 |
| Divide Creek | 0.00 | 0.00 | 0.85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.85 |
| Eightmile Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 7.75 | 0.16 | 0.33 | 0.66 | 0.00 | 0.00 | 0.00 | 8.90 |
| Fred Burr Creek | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.26 | 0.00 | 0.00 | 0.00 | 0.40 |
| Gird Creek | 0.00 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 1.29 |
| Howard Creek | 0.00 | 0.00 | 5.55 | 0.00 | 0.00 | 8.55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 14.11 |
| Kootenai Creek | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 |
| Lick Creek | 0.00 | 0.00 | 2.06 | 0.00 | 0.00 | 0.00 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 2.10 |
| Little Sleeping Child Creek | 0.00 | 0.00 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.30 | 0.00 | 0.00 | 0.00 | 2.47 |

**Table G3-3. Detailed Sediment Load from Unpaved Parallel Road Segments 6th Code by HUC/303(d) Subwatershed – Existing Conditions**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load |
| Lolo Creek-Grave Creek | 0.00 | 0.00 | 8.99 | 0.00 | 0.00 | 14.04 | 0.12 | 0.00 | 1.51 | 0.00 | 0.00 | 0.17 | 24.83 |
| Lost Horse Creek | 0.00 | 0.00 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.07 |
| Lower Bear Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 |
| Lower Burnt Fork Bitterroot River | 0.00 | 0.00 | 2.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 2.01 | 0.00 | 0.00 | 0.30 | 4.82 |
| Lower Lolo Creek | 0.00 | 0.00 | 6.68 | 0.00 | 0.00 | 15.20 | 0.61 | 0.01 | 5.36 | 0.00 | 0.00 | 0.00 | 27.86 |
| Lower Rye Creek | 0.00 | 0.00 | 0.65 | 0.00 | 0.00 | 0.00 | 0.06 | 0.08 | 8.28 | 0.00 | 0.00 | 0.00 | 9.06 |
| Lower Skalkaho Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45 |
| Lower Sleeping Child Creek | 0.00 | 0.00 | 3.73 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.20 | 0.00 | 0.00 | 0.00 | 3.96 |
| McCalla Creek | 0.00 | 0.00 | 1.92 | 0.00 | 0.00 | 0.00 | 0.11 | 0.17 | 0.20 | 0.00 | 0.00 | 0.00 | 2.40 |
| McClain Creek | 0.00 | 0.00 | 1.49 | 0.00 | 0.00 | 0.00 | 0.16 | 0.15 | 0.64 | 0.00 | 0.00 | 0.00 | 2.43 |
| Middle Skalkaho Creek | 0.00 | 0.00 | 2.69 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.69 |
| Middle Sleeping Child Creek | 0.00 | 0.00 | 2.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.51 |
| Mill Creek | 0.00 | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.43 | 0.26 | 0.00 | 0.00 | 0.00 | 1.16 |
| Miller Creek | 0.00 | 0.00 | 5.52 | 0.00 | 0.00 | 3.22 | 0.16 | 0.01 | 3.29 | 0.00 | 0.00 | 0.50 | 12.70 |
| Muddy Spring Creek | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| North Fork Rye Creek | 0.00 | 0.00 | 5.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.72 | 0.00 | 0.00 | 0.17 | 5.95 |
| O'Brien Creek | 0.00 | 0.00 | 7.10 | 0.00 | 0.00 | 0.10 | 0.13 | 0.04 | 3.35 | 0.00 | 0.00 | 0.00 | 10.72 |
| Roaring Lion Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| Rock Creek | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.07 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 |
| Sawtooth Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 | 0.30 | 0.00 | 0.00 | 0.00 | 0.44 |
| South Fork Lolo Creek | 0.00 | 0.00 | 1.27 | 0.00 | 0.00 | 0.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.04 |
| South Lost Horse Creek | 0.00 | 0.01 | 2.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.10 | 0.00 | 0.00 | 0.00 | 2.99 |
| Swan Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 | 0.18 | 0.05 | 0.00 | 0.00 | 0.00 | 0.41 |
| Sweathouse Creek | 0.00 | 0.00 | 1.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| Sweeney Creek | 0.00 | 0.00 | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.81 |
| Threemile Creek | 0.00 | 0.00 | 2.58 | 0.00 | 0.04 | 0.50 | 0.59 | 0.50 | 0.36 | 0.00 | 0.00 | 1.33 | 5.89 |
| Tin Cup Creek | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.03 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 |
| Upper Burnt Fork Bitterroot River | 0.00 | 0.00 | 1.22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.22 |
| Upper Lolo Creek | 0.00 | 0.00 | 5.51 | 0.00 | 0.00 | 3.57 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 9.14 |
| Upper Rye Creek | 0.00 | 0.00 | 15.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 | 0.00 | 0.00 | 15.49 |
| Upper Skalkaho Creek | 0.00 | 0.00 | 3.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.19 |
| Upper Sleeping Child Creek | 0.00 | 0.00 | 3.81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.81 |
| West Fork Butte Creek | 0.00 | 0.00 | 2.59 | 0.00 | 0.00 | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.38 |
| Willoughby Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.55 | 1.07 | 0.00 | 0.04 | 0.00 | 1.74 |
| Willow Creek | 0.00 | 0.00 | 4.11 | 0.00 | 0.00 | 0.00 | 0.13 | 0.26 | 0.52 | 0.00 | 0.00 | 0.00 | 5.01 |
| **Total** | **0.23** | **0.19** | **130.14** | **0.00** | **0.04** | **55.40** | **10.07** | **8.68** | **39.45** | **0.13** | **0.07** | **4.03** | **248.44** |

**Table G3-4. Total Sediment Load from Unpaved Road Network by 6th Code HUC/303(d) Subwatershed – Existing Conditions**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load (t/y) |
| Ambrose Creek | 0.00 | 0.54 | 4.50 | 0.00 | 0.00 | 0.00 | 1.79 | 3.92 | 0.51 | 0.00 | 0.00 | 0.00 | 11.26 |
| Bass Creek | 0.00 | 0.00 | 1.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 2.25 |
| Bear Creek | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 | 0.00 | 0.00 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 | 2.11 |
| Big Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 |
| Bitterroot River-Birch Creek | 0.00 | 0.00 | 1.09 | 0.00 | 0.00 | 0.00 | 1.54 | 15.36 | 1.09 | 0.00 | 0.24 | 0.00 | 19.32 |
| Bitterroot River-Canyon Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.23 | 2.04 | 0.00 | 0.00 | 0.00 | 0.00 | 3.27 |
| Bitterroot River-Chaffin Creek | 0.00 | 0.23 | 6.63 | 0.00 | 0.00 | 0.00 | 0.50 | 2.08 | 0.00 | 0.00 | 0.00 | 0.00 | 9.44 |
| Bitterroot River-Darby | 0.00 | 0.00 | 10.74 | 0.00 | 0.00 | 0.00 | 1.44 | 11.70 | 0.51 | 0.00 | 0.00 | 0.00 | 24.39 |
| Bitterroot River-Hayes Creek | 0.00 | 0.23 | 15.08 | 0.00 | 0.00 | 2.02 | 0.53 | 5.75 | 6.66 | 0.00 | 0.00 | 2.35 | 32.62 |
| Bitterroot River-Larry Creek | 0.20 | 0.68 | 1.74 | 0.00 | 0.00 | 0.00 | 3.63 | 16.63 | 0.00 | 0.00 | 0.00 | 0.00 | 22.87 |
| Bitterroot River-Lick Creek | 0.00 | 0.70 | 3.15 | 0.00 | 0.00 | 0.00 | 1.17 | 8.27 | 0.73 | 0.00 | 0.00 | 0.00 | 14.01 |
| Bitterroot River-North Woodchuck Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 1.81 | 9.87 | 5.82 | 5.13 | 0.23 | 0.77 | 23.70 |
| Bitterroot River-Spooner Creek | 0.00 | 0.23 | 3.22 | 0.00 | 0.00 | 0.00 | 1.52 | 6.40 | 0.34 | 0.00 | 0.00 | 0.00 | 11.71 |
| Bitterroot River-Woodside | 0.00 | 0.00 | 0.33 | 0.00 | 0.00 | 0.00 | 1.46 | 11.16 | 1.02 | 0.00 | 0.00 | 0.00 | 13.98 |
| Blodgett Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.92 |
| Burnt Fork Bitterroot River-Stevensville | 0.31 | 0.00 | 1.01 | 0.00 | 0.00 | 0.00 | 4.50 | 1.43 | 0.00 | 0.00 | 0.00 | 0.00 | 7.24 |
| Daly Creek | 0.00 | 0.00 | 5.83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.83 |
| Divide Creek | 0.00 | 0.00 | 2.77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.77 |
| Eightmile Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 13.99 | 0.51 | 3.41 | 1.50 | 0.00 | 0.00 | 0.00 | 19.41 |
| Fred Burr Creek | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 2.06 | 0.74 | 0.00 | 0.00 | 0.00 | 2.98 |
| Gird Creek | 0.00 | 0.00 | 3.05 | 0.00 | 0.00 | 0.00 | 0.00 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 | 4.19 |
| Howard Creek | 0.00 | 0.00 | 11.19 | 0.00 | 0.00 | 15.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 26.23 |
| Kootenai Creek | 0.00 | 0.00 | 0.44 | 0.00 | 0.00 | 0.00 | 0.00 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 | 1.60 |
| Lick Creek | 0.00 | 0.00 | 5.06 | 0.00 | 0.00 | 0.00 | 0.11 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 5.39 |
| Little Sleeping Child Creek | 0.00 | 0.00 | 3.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.50 | 0.00 | 0.00 | 0.00 | 5.71 |
| Lolo Creek-Grave Creek | 0.00 | 0.00 | 16.67 | 0.00 | 0.00 | 27.36 | 0.19 | 0.00 | 3.43 | 0.00 | 0.00 | 0.41 | 48.06 |
| Lost Horse Creek | 0.00 | 0.00 | 2.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.63 |
| Lower Bear Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.82 | 0.00 | 0.00 | 0.00 | 0.00 | 1.82 |
| Lower Burnt Fork Bitterroot River | 0.00 | 0.00 | 6.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.72 | 2.85 | 0.00 | 0.00 | 0.42 | 10.04 |
| Lower Lolo Creek | 0.00 | 0.00 | 17.60 | 0.00 | 0.00 | 32.84 | 2.01 | 0.45 | 9.56 | 0.00 | 0.00 | 0.00 | 62.46 |
| Lower Rye Creek | 0.00 | 0.00 | 1.85 | 0.00 | 0.00 | 0.00 | 0.20 | 1.40 | 13.32 | 0.00 | 0.00 | 0.00 | 16.76 |
| Lower Skalkaho Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.93 | 2.14 | 0.00 | 0.00 | 0.00 | 0.00 | 3.06 |
| Lower Sleeping Child Creek | 0.00 | 0.00 | 8.41 | 0.00 | 0.00 | 0.00 | 0.09 | 0.67 | 0.32 | 0.00 | 0.00 | 0.00 | 9.49 |
| McCalla Creek | 0.00 | 0.00 | 6.00 | 0.00 | 0.00 | 0.00 | 0.39 | 3.91 | 0.32 | 0.00 | 0.00 | 0.00 | 10.62 |
| McClain Creek | 0.00 | 0.00 | 3.41 | 0.00 | 0.00 | 0.00 | 0.37 | 3.45 | 1.84 | 0.00 | 0.00 | 0.00 | 9.06 |
| Middle Skalkaho Creek | 0.00 | 0.00 | 5.93 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.93 |
| Middle Sleeping Child Creek | 0.00 | 0.00 | 5.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.51 |
| Mill Creek | 0.00 | 0.00 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 | 10.99 | 0.62 | 0.00 | 0.00 | 0.00 | 12.92 |
| Miller Creek | 0.00 | 0.00 | 10.80 | 0.00 | 0.00 | 7.90 | 0.51 | 0.23 | 6.05 | 0.00 | 0.00 | 1.22 | 26.71 |
| Muddy Spring Creek | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 |
| North Fork Rye Creek | 0.00 | 0.00 | 11.90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.44 | 0.00 | 0.00 | 0.41 | 13.75 |

**Table G3-4. Total Sediment Load from Unpaved Road Network by 6th Code HUC/303(d) Subwatershed – Existing Conditions**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load (t/y) |
| O'Brien Creek | 0.00 | 0.00 | 14.78 | 0.00 | 0.00 | 0.34 | 0.27 | 0.48 | 6.83 | 0.00 | 0.00 | 0.00 | 22.70 |
| Roaring Lion Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 | 1.14 |
| Rock Creek | 0.00 | 0.00 | 0.51 | 0.00 | 0.00 | 0.00 | 0.28 | 0.23 | 0.00 | 0.00 | 0.00 | 0.00 | 1.02 |
| Sawtooth Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.10 | 0.78 | 0.00 | 0.00 | 0.00 | 4.88 |
| South Fork Lolo Creek | 0.00 | 0.00 | 3.43 | 0.00 | 0.00 | 2.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.52 |
| South Lost Horse Creek | 0.00 | 0.23 | 5.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.68 | 0.34 | 0.00 | 0.00 | 0.00 | 7.11 |
| Swan Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.67 | 5.02 | 0.17 | 0.00 | 0.00 | 0.00 | 5.86 |
| Sweathouse Creek | 0.00 | 0.00 | 5.43 | 0.00 | 0.00 | 0.00 | 0.00 | 4.57 | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 |
| Sweeney Creek | 0.00 | 0.00 | 2.30 | 0.00 | 0.00 | 0.00 | 0.00 | 1.39 | 0.00 | 0.00 | 0.00 | 0.00 | 3.69 |
| Threemile Creek | 0.00 | 0.00 | 5.58 | 0.00 | 0.26 | 0.74 | 1.64 | 10.84 | 0.60 | 0.00 | 0.00 | 1.93 | 21.58 |
| Tin Cup Creek | 0.00 | 0.00 | 3.80 | 0.00 | 0.00 | 0.00 | 0.10 | 1.39 | 0.00 | 0.00 | 0.00 | 0.00 | 5.29 |
| Upper Burnt Fork Bitterroot River | 0.00 | 0.00 | 3.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.50 |
| Upper Lolo Creek | 0.00 | 0.00 | 11.99 | 0.00 | 0.00 | 7.89 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 20.06 |
| Upper Rye Creek | 0.00 | 0.00 | 33.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.45 | 0.00 | 0.00 | 0.00 | 33.61 |
| Upper Skalkaho Creek | 0.00 | 0.00 | 8.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.71 |
| Upper Sleeping Child Creek | 0.00 | 0.00 | 9.93 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.93 |
| West Fork Butte Creek | 0.00 | 0.00 | 7.39 | 0.00 | 0.00 | 1.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 9.38 |
| Willoughby Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 5.83 | 1.67 | 0.00 | 0.92 | 0.00 | 8.64 |
| Willow Creek | 0.00 | 0.00 | 8.67 | 0.00 | 0.00 | 0.00 | 0.48 | 4.44 | 0.88 | 0.00 | 0.22 | 0.00 | 14.68 |
| **Total** | **0.51** | **2.83** | **304.74** | **0.00** | **0.26** | **112.28** | **30.09** | **171.70** | **73.05** | **5.13** | **1.61** | **7.51** | **709.72** |

**Table G3-5B. Fish Passage Analysis for Selected Road Crossings Using Alaska Region Criteria**

| Location ID | Structure Type | Culvert Dimensions (ft) | Width (ft) | Culvert slope (%) | Bankfull width (ft) | Culvert/BF ratio | Fill Height (ft) | Fill Width (ft) | Fill Length (ft) | Fill Volume (CY) | Outlet Perch (inches) | Final Classification (# of failures) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRHC-M1 | Round CMP | 1 | 1.0 | 0 (1) | 2 | 0.50 (3) | 2 | 5 | 16 | 0.74 | 0 (1) | 1 (3) |
| BRHC-M2 | Round CMP | 2.5 | 2.5 | 4 (3) | 4 | 0.63 (2) | 4 | 11 | 22 | 6.52 | 2 (2) | 1 (3) |
| BRHC-M4 | Round CMP | 2 | 2.0 | 10 (3) | 2 | 1.00 (1) | 5 | 60 | 16 | 22.22 | N/A | 1 (3) |
| MC-M8 | Round CMP | 3.5 | 3.5 | | 7.5 | 0.47 (3) | 4.5 | 25 | 9 | 31.25 | 11 (3) | 2 (3) |
| MC-M9 | Squash CMP | 3.0 x 2.0 | 3.0 | | 4 | 0.75 (2) | 3 | 43 | 10 | 19.11 | 0 (1) | (2) |
| BRNWC-M12 | Round CMP | 3 | 3.0 | | 3.5 | 0.9 (1) | 7 | 30 | 12 | 27.22 | 6 (3) | 1 (3) |
| EMC-M16 | Squash CMP | W-3.5, H-2.5 | 3.5 | | 2 | 1.8 (1) | 5.5 | 33 | 11 | 13.44 | 16 (3) | 1 (3) |
| EMC-M17 | Round CMP | 2 | 2.0 | | 4 | 0.5 (3) | 35 | 64 | 30 | 331.85 | 6 (3) | 2 (3) |
| TMC-F19 | Round CMP | 24"-D | 2.0 | 0 (1) | 2 | 1.0 (1) | 3 | 30 | 10 | 6.67 | 0 (1) | (1) |
| TMC-M20 | Squash CMP | H-2.33, W-3.5 | 3.5 | 0 (1) | 4 | 0.9 (1) | 1 | 18 | 10 | 2.67 | 0 (1) | (1) |
| TMC-F22 | Round CMP | 3.0-CMP, 2.75-Dry | 3.0 | 1 (2) | 9 | 0.3 (3) | 2.5 | 25 | 11 | 20.83 | 1 (2) | 1 (3) |
| AC-M25 | Round CMP | 3 | 3.0 | 5 (3) | 7 | 0.4 (3) | 3 | 45 | 15 | 35.00 | 5 (3) | 3 (3) |
| BFBRS-V28 | Round CMP | 3 | 3.0 | 2 (3) | 6 | 0.5 (3) | 2 | 34 | 12 | 15.11 | 0 (1) | 2 (3) |
| BRSC-F37 | Round CMP | 1.5 | 1.5 | 1 (2) | 3 | 0.5 (3) | 4 | 10 | 28 | 4.44 | 0 (1) | 1 (3) |
| LLC-M46 | Round CMP | 1.5 | 1.5 | 3 (3) | 4 | 0.4 (3) | 4 | 8 | 35 | 4.74 | 0 (1) | 2 (3) |
| ULC-M48 | Round CMP | 3 | 3.0 | 5 (3) | 4.5 | 0.7 (2) | 2 | 8 | 26 | 2.67 | 12 (3) | 2 (3) |
| HC-M49 | Squash CMP | 3.0 X 4.5 | 3.0 | 1 (2) | 4 | 1.1 (1) | 2.5 | 7 | 40 | 2.59 | 0 (1) | (2) |
| ULC-M56 | Round CMP | 2 | 2.0 | 27 (3) | 3 | 0.7 (2) | 5 | 9 | 32 | 5.00 | N/A | 1 (3) |
| WFBC-M58 | Round CMP | 2.5 | 2.5 | 10 (3) | 5 | 0.5 (3) | 3.5 | 7 | 32 | 4.54 | 4 (2) | 2 (3) |
| LCGC-M59 | Round CMP | 1.5 | 1.5 | 3 (3) | 3 | 0.5 (3) | 5 | 8 | 42 | 4.44 | 0 (1) | 2 (3) |
| SFLC-M65 | Round CMP | 3 | 3.0 | 2 (3) | 6 | 0.5 (3) | 3 | 8 | 30 | 5.33 | 1 (2) | 2 (3) |
| SFLC-M67 | Round CMP | 2.5 | 2.5 | 3 (3) | 2 | 1.3 (1) | 3 | 10 | 35 | 2.22 | 1 (2) | 1 (3) |
| WFBC-M68 | Round CMP | 2.5 | 2.5 | 2 (3) | 7 | 0.4 (3) | 3.5 | 10 | 60 | 9.07 | 32 (3) | 3 (3) |
| LCGC-M77 | Culvert CMP | 1.5 | 1.5 | 2 (3) | 4 | 0.4 (3) | 1 | 6 | 16 | 0.89 | 7 (3) | 3 (3) |
| LCGC-M79 | Round CMP | 3 | 3.0 | 3 (3) | 10 | 0.3 (3) | 9.75 | 15 | 50 | 54.17 | 10 (3) | 3 (3) |
| LBFBR-M86 | Steel CMP/DS- concrete | 1.5 | 1.5 | 3 (3) | 5 | 0.3 (3) | 7 | 10 | 60 | 12.96 | 0 (1) | 2 (3) |
| BC-M87 | Steel CMP | 3 | 3.0 | 17 (3) | 6 | 0.5 (3) | 2.5 | 22 | 28 | 12.22 | 15 (3) | 3 (3) |
| MC-F88 | Steel CMP | 2 | 2.0 | 2 (3) | 3 | 0.7 (2) | 1 | 6 | 19 | 0.67 | 0 (1) | 1 (3) |
| MC-F89 | Steel CMP | 2 | 2.0 | 4 (3) | 8 | 0.3 (3) | 3.5 | 12 | 38 | 12.44 | 10 (3) | 3 (3) |
| MC-F89a | Steel CMP | 1 | 1.0 | 4 (3) | 3 | 0.3 (3) | 3.5 | 6 | 38 | 2.33 | 0 (1) | 2 (3) |
| BRBC-F90 | Squash CMP | 2 X 1.5 | 2.0 | 2 (3) | 5 | 0.4 (3) | 2.5 | 9 | 32 | 4.17 | 0 (1) | 2 (3) |
| BRLiC-F94 | Steel CMP | 1.5 | 1.5 | 2 (3) | 12 | 0.1 (3) | 2.5 | 23 | 35 | 25.56 | 0 (1) | 2 (3) |
| WC-M97 | Steel CMP | 2 | 2.0 | 7 (3) | 7 | 0.3 (3) | 4.5 | 18 | 31 | 21.00 | 0 (1) | 2 (3) |
| BRBC-F102 | Steel CMP | 2 | 2.0 | 1 (2) | 15 | 0.1 (3) | 5 | 21 | 15 | 58.33 | 0 (1) | 1 (3) |
| BRW-F105 | Steel CMP | 3 | 3.0 | 2 (3) | 14 | 0.2 (3) | 8 | 21 | 32 | 87.11 | 0 (1) | 2 (3) |
| BRCC-V114 | Steel CMP | 1.5 | 1.5 | 2 (3) | 5 | 0.3 (3) | 2 | 8 | 34 | 2.96 | 0 (1) | 2 (3) |
| LRC-M115 | Plastic CMP | 3 | 3.0 | 15 (3) | 10 | 0.3 (3) | 8 | 17 | 36 | 50.37 | 0 (1) | 2 (3) |
| URC-M116 | Round CMP | 1.5 | 1.5 | 2 (3) | 5 | 0.3 (3) | 4.5 | 10 | 25 | 8.33 | 0 (1) | 2 (3) |
| URC-M123 | Plastic CMP | 3 | 3.0 | 3 (3) | 4 | 0.8 (2) | 3 | 10 | 39 | 4.44 | 0 (1) | 1 (3) |
| LRC-M128 | Round CMP | 1.5 | 1.5 | 2 (3) | 6 | 0.3 (3) | 2.5 | 7 | 25 | 3.89 | Blocked (3) | 3 (3) |
| BRCC-V137 | Round CMP | 1.5 | 1.5 | 1 (2) | 2.5 | 0.6 (2) | 1 | 2 | 20 | 0.19 | 0 (1) | (2) |
| BRCC-M141 | Round CMP | 1.5 | 1.5 | 10 (3) | 3 | 0.5 (3) | 10 | 10 | 24 | 11.11 | 0 (1) | 2 (3) |
| LRC-F143 | Squash CMP | 2 x 3 | 3.0 | 1 (2) | 4 | 0.8 (2) | 1 | 6 | 30 | 0.89 | 0 (1) | (2) |
| BRD-F145 | Round CMP | 3 | 3.0 | 1 (2) | 6 | 0.5 (3) | 2 | 6 | 18 | 2.67 | 0 (1) | 1 (3) |
| LRC-M146 | Plastic CMP | 3 | 2.8 | 4 (3) | 3.5 | 0.8 (1) | 4.5 | 6 | 30 | 3.50 | 6 (3) | 2 (3) |
| USC-M158 | Round CMP | 3 | 3.0 | 5 (3) | 3 | 1.0 (1) | 3 | 5 | 32 | 1.67 | - | 1 (3) |

**Table G3-5B. Fish Passage Analysis for Selected Road Crossings Using Alaska Region Criteria**

| Location ID | Structure Type | Culvert Dimensions (ft) | Width (ft) | Culvert slope (%) | Bankfull width (ft) | Culvert/BF ratio | Fill Height (ft) | Fill Width (ft) | Fill Length (ft) | Fill Volume (CY) | Outlet Perch (inches) | Final Classification (# of failures) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIVC-M159 | Squash CMP | 4-W, 4.33-H | 4.0 | 5 [3] | 10 | 0.4 [3] | 2 | 10 | 30 | 7.41 | 4 [2] | 2 [3] |
| BRW-F168 | Squash CMP | 2.5W, 3.5H | 2.5 | | 3 | 0.8 [1] | - | - | - | | 18 [3] | 1 [3] |
| WC-M170 | Round CMP | 3 | 3.0 | 10 [3] | 5 | 0.6 [2] | 10 | 6 | 30 | 11.11 | - | 1 [3] |
| WC-M171 | Round CMP | 4H, 3W | 3.0 | 10 [3] | 6 | 0.5 [3] | - | - | - | | 12 [3] | 3 [3] |
| BRNWC-M174 | Round CMP | 2 | 2.0 | 6 [3] | 5 | 0.4 [3] | 1 | 8 | 15 | 1.48 | 1.5 [2] | 2 [3] |
| BRLiC-F186 | Round CMP | 1 | 1.0 | 3 [3] | 16 | 0.8 [2] | 13 | 39 | 70 | 300.44 | 0 [1] | 1 [3] |
| BRLiC-F187 | Round CMP | 2 | 2.0 | 2 [3] | 20 | 0.1 [3] | 5.5 | 18 | 33 | 73.33 | 0 [1] | 2 [3] |
| BRW-F188 | Plastic CMP | 2 | 2.0 | 1 [2] | 18 | 1.3 [1] | 1 | 22 | 80 | 14.67 | 3 [2] | [2] |
| McC-F189 | Round CMP | 1.5 | 1.5 | 2 [3] | 5 | 0.3 [3] | 1.5 | 10 | 29 | 2.78 | 0 [1] | 2 [3] |
| McC-F190 | 2-Squashed CMPs | 2.5 x 3.0 | 3.0 | 2 [3] | 12 | 0.3 [3] | 1 | 21 | 34 | 9.33 | 4.5 [3] | 3 [3] |
| LLC-M191 | Round CMP | 3 | 3.0 | 6 [3] | 11 | 0.3 [3] | 7 | 14 | 35 | 39.93 | 0 [1] | 2 [3] |
| BC-F192 | Concrete | 2 | 2.0 | 1 [2] | 8 | 0.3 [3] | 3 | 11 | 20 | 9.78 | 0 [1] | 1 [3] |
| **For Sites with >48" span - Assumed Most Conservative Case Using >1X3 Spiral Configurations** | | | | | | | | | | | | |
| EMC-V15 | Round CMP | 5 | 5.0 | 0 [1] | 6 | 0.8 [1] | 6 | 58 | 10 | 77.33 | 0 [1] | [1] |
| EMC-M18 | Squash CMP | W-5.0, H-2.5 | 5.0 | 10 [3] | 8.5 | 0.6 [2] | 9.5 | 381 | 12 | 1139.47 | 0 [1] | 1 [3] |
| MC-M35 | Round CMP | 7 | 7.0 | 8 [3] | 9 | 0.8 [1] | 10 | 20 | 35 | 66.67 | 18 [3] | 2 [3] |
| WFBC-M64 | Squash CMP | 4.0H x 6.7W | 6.7 | 3 [3] | 10 | 0.7 [2] | 4.5 | 20 | 71 | 33.33 | 0 [1] | 1 [3] |
| LBFBR-M85 | Steel CMP 3- Culverts | Squashed 7 X 4.5 | 7.0 | 2 [2] | 38 | 0.2 [3] | 0.75 | 40 | 24 | 42.22 | 0 [1] | 1 [3] |
| URC-M125 | Squash CMP | 6 x 9 | 9.0 | 2 [2] | 13 | 0.7 [2] | 11 | 37 | 46 | 195.96 | 0 [1] | [2] |
| LRC-M127 | Round CMP | 5 | 5.0 | 0 [1] | 7 | 0.7 [2] | 4 | 16 | 25 | 16.59 | - | [2] |
| BRD-F160 | Concrete Flume | 5 | 5.0 | 2 [2] | 3 | 1.7 [1] | - | - | - | | - | [2] |
| SC-F194 | Round CMP | 7 X 22 | 22.0 | 1 [2] | 40 | 0.2 [3] | Concrete | | | | | 1 [3] |

[1] High certainty of meeting juvenile fish passage at all flows, [2] Additional and more detailed analysis is required to determine juvenile fish passage ability, [3] High certainty of <u>not</u> providing juvenile fish passage at all desired stream flows

CMP = Corrugated Metal Pipe

**Table G4-2. Estimated Sediment Load from Unpaved Road Crossings – Reduce Length to 200-feet**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load (t/y) |
| Ambrose Creek | 0.00 | 0.11 | 0.84 | 0.00 | 0.00 | 0.00 | 0.60 | 0.89 | 0.08 | 0.00 | 0.00 | 0.00 | 2.52 |
| Bass Creek | 0.00 | 0.00 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 |
| Bear Creek | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.47 |
| Big Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 |
| Bitterroot River-Birch Creek | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.47 | 3.47 | 0.17 | 0.00 | 0.05 | 0.00 | 4.41 |
| Bitterroot River-Canyon Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.88 |
| Bitterroot River-Chaffin Creek | 0.00 | 0.05 | 1.34 | 0.00 | 0.00 | 0.00 | 0.13 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| Bitterroot River-Darby | 0.00 | 0.00 | 2.30 | 0.00 | 0.00 | 0.00 | 0.47 | 2.63 | 0.04 | 0.00 | 0.00 | 0.00 | 5.44 |
| Bitterroot River-Hayes Creek | 0.00 | 0.05 | 2.76 | 0.00 | 0.00 | 0.42 | 0.17 | 1.31 | 1.25 | 0.00 | 0.00 | 0.42 | 6.38 |
| Bitterroot River-Larry Creek | 0.03 | 0.16 | 0.42 | 0.00 | 0.00 | 0.00 | 1.18 | 3.78 | 0.00 | 0.00 | 0.00 | 0.00 | 5.57 |
| Bitterroot River-Lick Creek | 0.00 | 0.16 | 0.75 | 0.00 | 0.00 | 0.00 | 0.40 | 1.89 | 0.17 | 0.00 | 0.00 | 0.00 | 3.37 |
| Bitterroot River-North Woodchuck Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.57 | 2.21 | 0.75 | 0.17 | 0.05 | 0.13 | 3.87 |
| Bitterroot River-Spooner Creek | 0.00 | 0.05 | 0.79 | 0.00 | 0.00 | 0.00 | 0.50 | 1.47 | 0.08 | 0.00 | 0.00 | 0.00 | 2.90 |
| Bitterroot River-Woodside | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.50 | 2.52 | 0.25 | 0.00 | 0.00 | 0.00 | 3.36 |
| Blodgett Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 |
| Burnt Fork Bitterroot River-Stevensville | 0.10 | 0.00 | 0.21 | 0.00 | 0.00 | 0.00 | 1.31 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 1.94 |
| Daly Creek | 0.00 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.25 |

**Table G4-2. Estimated Sediment Load from Unpaved Road Crossings – Reduce Length to 200-feet**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load (t/y) |
| Divide Creek | 0.00 | 0.00 | 0.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.67 |
| Eightmile Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.17 | 0.17 | 0.74 | 0.29 | 0.00 | 0.00 | 0.00 | 3.37 |
| Fred Burr Creek | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.47 | 0.17 | 0.00 | 0.00 | 0.00 | 0.68 |
| Gird Creek | 0.00 | 0.00 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.89 |
| Howard Creek | 0.00 | 0.00 | 1.96 | 0.00 | 0.00 | 2.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 4.22 |
| Kootenai Creek | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 |
| Lick Creek | 0.00 | 0.00 | 1.05 | 0.00 | 0.00 | 0.00 | 0.03 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 1.13 |
| Little Sleeping Child Creek | 0.00 | 0.00 | 0.71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.42 | 0.00 | 0.00 | 0.00 | 1.13 |
| Lolo Creek-Grave Creek | 0.00 | 0.00 | 2.68 | 0.00 | 0.00 | 4.64 | 0.03 | 0.00 | 0.67 | 0.00 | 0.00 | 0.08 | 8.10 |
| Lost Horse Creek | 0.00 | 0.00 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.54 |
| Lower Bear Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.42 |
| Lower Burnt Fork Bitterroot River | 0.00 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.29 | 0.00 | 0.00 | 0.04 | 1.75 |
| Lower Lolo Creek | 0.00 | 0.00 | 3.80 | 0.00 | 0.00 | 6.14 | 0.67 | 0.11 | 1.46 | 0.00 | 0.00 | 0.00 | 12.19 |
| Lower Rye Creek | 0.00 | 0.00 | 0.42 | 0.00 | 0.00 | 0.00 | 0.07 | 0.32 | 1.76 | 0.00 | 0.00 | 0.00 | 2.56 |
| Lower Skalkaho Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.77 |
| Lower Sleeping Child Creek | 0.00 | 0.00 | 1.63 | 0.00 | 0.00 | 0.00 | 0.03 | 0.16 | 0.04 | 0.00 | 0.00 | 0.00 | 1.86 |
| McCalla Creek | 0.00 | 0.00 | 1.42 | 0.00 | 0.00 | 0.00 | 0.13 | 0.89 | 0.04 | 0.00 | 0.00 | 0.00 | 2.49 |
| McClain Creek | 0.00 | 0.00 | 0.67 | 0.00 | 0.00 | 0.00 | 0.10 | 0.79 | 0.42 | 0.00 | 0.00 | 0.00 | 1.98 |
| Middle Skalkaho Creek | 0.00 | 0.00 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.13 |
| Middle Sleeping Child Creek | 0.00 | 0.00 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.05 |
| Mill Creek | 0.00 | 0.00 | 0.29 | 0.00 | 0.00 | 0.00 | 0.00 | 2.52 | 0.13 | 0.00 | 0.00 | 0.00 | 2.94 |
| Miller Creek | 0.00 | 0.00 | 1.84 | 0.00 | 0.00 | 1.63 | 0.17 | 0.05 | 0.96 | 0.00 | 0.00 | 0.25 | 4.90 |
| Muddy Spring Creek | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| North Fork Rye Creek | 0.00 | 0.00 | 2.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.08 | 2.72 |
| O'Brien Creek | 0.00 | 0.00 | 2.68 | 0.00 | 0.00 | 0.08 | 0.07 | 0.11 | 1.21 | 0.00 | 0.00 | 0.00 | 4.14 |
| Roaring Lion Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 |
| Rock Creek | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.10 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.28 |
| Sawtooth Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.95 | 0.17 | 0.00 | 0.00 | 0.00 | 1.11 |
| South Fork Lolo Creek | 0.00 | 0.00 | 0.75 | 0.00 | 0.00 | 0.46 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.21 |
| South Lost Horse Creek | 0.00 | 0.05 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.08 | 0.00 | 0.00 | 0.00 | 1.34 |
| Swan Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 1.16 | 0.04 | 0.00 | 0.00 | 0.00 | 1.43 |
| Sweathouse Creek | 0.00 | 0.00 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 | 2.30 |
| Sweeney Creek | 0.00 | 0.00 | 0.54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.86 |
| Threemile Creek | 0.00 | 0.00 | 1.05 | 0.00 | 0.05 | 0.08 | 0.50 | 2.47 | 0.08 | 0.00 | 0.00 | 0.21 | 4.45 |
| Tin Cup Creek | 0.00 | 0.00 | 0.92 | 0.00 | 0.00 | 0.00 | 0.03 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 1.27 |
| Upper Burnt Fork Bitterroot River | 0.00 | 0.00 | 0.79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.79 |
| Upper Lolo Creek | 0.00 | 0.00 | 2.26 | 0.00 | 0.00 | 1.50 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 3.80 |
| Upper Rye Creek | 0.00 | 0.00 | 6.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 6.31 |
| Upper Skalkaho Creek | 0.00 | 0.00 | 1.92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.92 |
| Upper Sleeping Child Creek | 0.00 | 0.00 | 2.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.13 |
| West Fork Butte Creek | 0.00 | 0.00 | 1.67 | 0.00 | 0.00 | 0.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.09 |
| Willoughby Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 1.26 | 0.21 | 0.00 | 0.21 | 0.00 | 1.75 |
| Willow Creek | 0.00 | 0.00 | 1.59 | 0.00 | 0.00 | 0.00 | 0.17 | 1.00 | 0.13 | 0.00 | 0.05 | 0.00 | 2.93 |
| **Total** | **0.13** | **0.63** | **60.82** | **0.00** | **0.05** | **19.81** | **9.61** | **38.90** | **11.70** | **0.17** | **0.37** | **1.21** | **143.41** |

**Table G4-3. Estimated Sediment Load from Unpaved Parallel Road Segments – Reduce Length to 500-feet**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load |
| Ambrose Creek | 0.00 | 0.08 | 0.83 | 0.00 | 0.00 | 0.00 | 0.24 | 0.14 | 0.11 | 0.00 | 0.00 | 0.00 | 1.40 |
| Bass Creek | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 |
| Bear Creek | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.21 |
| Big Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Bitterroot River-Birch Creek | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.25 | 0.67 | 0.24 | 0.00 | 0.01 | 0.00 | 1.33 |
| Bitterroot River-Canyon Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.17 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 |
| Bitterroot River-Chaffin Creek | 0.00 | 0.01 | 1.11 | 0.00 | 0.00 | 0.00 | 0.10 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 1.30 |
| Bitterroot River-Darby | 0.00 | 0.00 | 1.65 | 0.00 | 0.00 | 0.00 | 0.21 | 0.56 | 0.15 | 0.00 | 0.00 | 0.00 | 2.57 |
| Bitterroot River-Hayes Creek | 0.00 | 0.00 | 2.85 | 0.00 | 0.00 | 0.33 | 0.08 | 0.20 | 1.22 | 0.00 | 0.00 | 0.46 | 5.14 |
| Bitterroot River-Larry Creek | 0.06 | 0.02 | 0.21 | 0.00 | 0.00 | 0.00 | 0.53 | 0.63 | 0.00 | 0.00 | 0.00 | 0.00 | 1.44 |
| Bitterroot River-Lick Creek | 0.00 | 0.03 | 0.39 | 0.00 | 0.00 | 0.00 | 0.15 | 0.28 | 0.10 | 0.00 | 0.00 | 0.00 | 0.95 |
| Bitterroot River-North Woodchuck Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.28 | 0.50 | 1.46 | 0.06 | 0.01 | 0.16 | 2.49 |
| Bitterroot River-Spooner Creek | 0.00 | 0.01 | 0.38 | 0.00 | 0.00 | 0.00 | 0.21 | 0.19 | 0.04 | 0.00 | 0.00 | 0.00 | 0.82 |
| Bitterroot River-Woodside | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.19 | 0.48 | 0.12 | 0.00 | 0.00 | 0.00 | 0.82 |
| Blodgett Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| Burnt Fork Bitterroot River-Stevensville | 0.04 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.79 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 1.08 |
| Daly Creek | 0.00 | 0.00 | 0.89 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.89 |
| Divide Creek | 0.00 | 0.00 | 0.34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.34 |
| Eightmile Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.08 | 0.07 | 0.26 | 0.26 | 0.00 | 0.00 | 0.00 | 3.68 |
| Fred Burr Creek | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.10 | 0.00 | 0.00 | 0.00 | 0.19 |
| Gird Creek | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.53 |
| Howard Creek | 0.00 | 0.00 | 2.21 | 0.00 | 0.00 | 3.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.61 |
| Kootenai Creek | 0.00 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 |
| Lick Creek | 0.00 | 0.00 | 0.82 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.84 |
| Little Sleeping Child Creek | 0.00 | 0.00 | 0.47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.52 | 0.00 | 0.00 | 0.00 | 0.98 |
| Lolo Creek-Grave Creek | 0.00 | 0.00 | 3.58 | 0.00 | 0.00 | 5.59 | 0.05 | 0.00 | 0.60 | 0.00 | 0.00 | 0.07 | 9.88 |
| Lost Horse Creek | 0.00 | 0.00 | 0.42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.42 |
| Lower Bear Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 |
| Lower Burnt Fork Bitterroot River | 0.00 | 0.00 | 0.98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.80 | 0.00 | 0.00 | 0.12 | 1.94 |
| Lower Lolo Creek | 0.00 | 0.00 | 2.66 | 0.00 | 0.00 | 6.05 | 0.27 | 0.01 | 2.13 | 0.00 | 0.00 | 0.00 | 11.12 |
| Lower Rye Creek | 0.00 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | 0.03 | 0.07 | 3.29 | 0.00 | 0.00 | 0.00 | 3.64 |
| Lower Skalkaho Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 |
| Lower Sleeping Child Creek | 0.00 | 0.00 | 1.48 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.08 | 0.00 | 0.00 | 0.00 | 1.58 |
| McCalla Creek | 0.00 | 0.00 | 0.76 | 0.00 | 0.00 | 0.00 | 0.05 | 0.13 | 0.08 | 0.00 | 0.00 | 0.00 | 1.03 |
| McClain Creek | 0.00 | 0.00 | 0.59 | 0.00 | 0.00 | 0.00 | 0.07 | 0.12 | 0.25 | 0.00 | 0.00 | 0.00 | 1.03 |
| Middle Skalkaho Creek | 0.00 | 0.00 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.07 |
| Middle Sleeping Child Creek | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| Mill Creek | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.34 | 0.10 | 0.00 | 0.00 | 0.00 | 0.64 |
| Miller Creek | 0.00 | 0.00 | 2.19 | 0.00 | 0.00 | 1.28 | 0.07 | 0.01 | 1.31 | 0.00 | 0.00 | 0.20 | 5.06 |
| Muddy Spring Creek | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| North Fork Rye Creek | 0.00 | 0.00 | 2.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.29 | 0.00 | 0.00 | 0.07 | 2.37 |
| O'Brien Creek | 0.00 | 0.00 | 2.83 | 0.00 | 0.00 | 0.04 | 0.06 | 0.03 | 1.33 | 0.00 | 0.00 | 0.00 | 4.28 |
| Roaring Lion Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| Rock Creek | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 |
| Sawtooth Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.12 | 0.00 | 0.00 | 0.00 | 0.23 |

**Table G4-3. Estimated Sediment Load from Unpaved Parallel Road Segments – Reduce Length to 500-feet**

| Ownership | Federal Land | | | Plum Creek Timber | | | Private | | | State | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Watershed | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Valley | Foothill | Mountain | Load |
| South Fork Lolo Creek | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.81 |
| South Lost Horse Creek | 0.00 | 0.01 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.04 | 0.00 | 0.00 | 0.00 | 1.20 |
| Swan Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.14 | 0.02 | 0.00 | 0.00 | 0.00 | 0.24 |
| Sweathouse Creek | 0.00 | 0.00 | 0.73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.86 |
| Sweeney Creek | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.35 |
| Threemile Creek | 0.00 | 0.00 | 1.03 | 0.00 | 0.04 | 0.20 | 0.26 | 0.40 | 0.14 | 0.00 | 0.00 | 0.53 | 2.59 |
| Tin Cup Creek | 0.00 | 0.00 | 0.46 | 0.00 | 0.00 | 0.00 | 0.01 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.53 |
| Upper Burnt Fork Bitterroot River | 0.00 | 0.00 | 0.48 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.48 |
| Upper Lolo Creek | 0.00 | 0.00 | 2.19 | 0.00 | 0.00 | 1.42 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 3.63 |
| Upper Rye Creek | 0.00 | 0.00 | 6.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 6.16 |
| Upper Skalkaho Creek | 0.00 | 0.00 | 1.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.27 |
| Upper Sleeping Child Creek | 0.00 | 0.00 | 1.52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.52 |
| West Fork Butte Creek | 0.00 | 0.00 | 1.03 | 0.00 | 0.00 | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.35 |
| Willoughby Creek | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.44 | 0.43 | 0.00 | 0.03 | 0.00 | 0.93 |
| Willow Creek | 0.00 | 0.00 | 1.63 | 0.00 | 0.00 | 0.00 | 0.06 | 0.20 | 0.21 | 0.00 | 0.00 | 0.00 | 2.10 |
| **Total** | **0.10** | **0.15** | **51.76** | **0.00** | **0.04** | **22.04** | **4.50** | **6.94** | **15.69** | **0.06** | **0.05** | **1.60** | **102.93** |

**Table G4-4. Total Sediment Load Reductions from Unpaved Road Network: 200-feet Crossing BMP and 500-feet Parallel BMP**

| Watershed | Total Sediment Load From Unpaved Roads Existing Conditions (tons/year) | Total Sediment Load After 200-ft Crossing and 500 ft Parallel Road Length BMPs (tons/year) | Percent Reduction in Load After 200-ft Crossing and 500 ft Parallel Road Length BMPs (tons/year) |
|---|---|---|---|
| Ambrose Creek | 11.26 | 3.92 | 65.14% |
| Bass Creek | 2.25 | 0.72 | 68.13% |
| Bear Creek | 2.11 | 0.68 | 67.77% |
| Big Creek | 0.23 | 0.06 | 74.68% |
| Bitterroot River-Birch Creek | 19.32 | 5.73 | 70.33% |
| Bitterroot River-Canyon Creek | 3.27 | 1.10 | 66.38% |
| Bitterroot River-Chaffin Creek | 9.44 | 3.29 | 65.12% |
| Bitterroot River-Darby | 24.39 | 8.00 | 67.19% |
| Bitterroot River-Hayes Creek | 32.62 | 11.52 | 64.69% |
| Bitterroot River-Larry Creek | 22.87 | 7.01 | 69.36% |
| Bitterroot River-Lick Creek | 14.01 | 4.32 | 69.18% |
| Bitterroot River-North Woodchuck Creek | 23.70 | 6.37 | 73.13% |
| Bitterroot River-Spooner Creek | 11.71 | 3.73 | 68.17% |
| Bitterroot River-Woodside | 13.98 | 4.18 | 70.09% |
| Blodgett Creek | 0.92 | 0.24 | 74.18% |
| Burnt Fork Bitterroot River-Stevensville | 7.24 | 3.02 | 58.34% |
| Daly Creek | 5.83 | 2.14 | 63.28% |
| Divide Creek | 2.77 | 1.01 | 63.65% |
| Eightmile Creek | 19.41 | 7.05 | 63.68% |
| Fred Burr Creek | 2.98 | 0.87 | 70.77% |
| Gird Creek | 4.19 | 1.42 | 66.09% |
| Howard Creek | 26.23 | 9.83 | 62.51% |
| Kootenai Creek | 1.60 | 0.47 | 70.54% |
| Lick Creek | 5.39 | 1.97 | 63.43% |
| Little Sleeping Child Creek | 5.71 | 2.11 | 63.03% |
| Lolo Creek-Grave Creek | 48.06 | 17.98 | 62.58% |
| Lost Horse Creek | 2.63 | 0.97 | 63.16% |
| Lower Bear Creek | 1.82 | 0.47 | 74.38% |
| Lower Burnt Fork Bitterroot River | 10.04 | 3.69 | 63.29% |
| Lower Lolo Creek | 62.46 | 23.30 | 62.69% |
| Lower Rye Creek | 16.76 | 6.20 | 63.04% |

**Table G4-4. Total Sediment Load Reductions from Unpaved Road Network: 200-feet Crossing BMP and 500-feet Parallel BMP**

| Watershed | Total Sediment Load From Unpaved Roads Existing Conditions (tons/year) | Total Sediment Load After 200-ft Crossing and 500 ft Parallel Road Length BMPs (tons/year) | Percent Reduction in Load After 200-ft Crossing and 500 ft Parallel Road Length BMPs (tons/year) |
|---|---|---|---|
| Lower Skalkaho Creek | 3.06 | 1.03 | 66.30% |
| Lower Sleeping Child Creek | 9.49 | 3.44 | 63.73% |
| McCalla Creek | 10.62 | 3.52 | 66.88% |
| McClain Creek | 9.06 | 3.01 | 66.79% |
| Middle Skalkaho Creek | 5.93 | 2.20 | 62.93% |
| Middle Sleeping Child Creek | 5.51 | 2.04 | 62.92% |
| Mill Creek | 12.92 | 3.57 | 72.35% |
| Miller Creek | 26.71 | 9.96 | 62.70% |
| Muddy Spring Creek | 0.16 | 0.06 | 63.97% |
| North Fork Rye Creek | 13.75 | 5.09 | 63.03% |
| O'Brien Creek | 22.70 | 8.43 | 62.87% |
| Roaring Lion Creek | 1.14 | 0.30 | 74.13% |
| Rock Creek | 1.02 | 0.38 | 63.03% |
| Sawtooth Creek | 4.88 | 1.34 | 72.46% |
| South Fork Lolo Creek | 5.52 | 2.02 | 63.34% |
| South Lost Horse Creek | 7.11 | 2.54 | 64.30% |
| Swan Creek | 5.86 | 1.68 | 71.40% |
| Sweathouse Creek | 10.00 | 3.17 | 68.33% |
| Sweeney Creek | 3.69 | 1.21 | 67.26% |
| Threemile Creek | 21.58 | 7.04 | 67.40% |
| Tin Cup Creek | 5.29 | 1.80 | 66.00% |
| Upper Burnt Fork Bitterroot River | 3.50 | 1.28 | 63.45% |
| Upper Lolo Creek | 20.06 | 7.44 | 62.92% |
| Upper Rye Creek | 33.61 | 12.47 | 62.89% |
| Upper Skalkaho Creek | 8.71 | 3.19 | 63.36% |
| Upper Sleeping Child Creek | 9.93 | 3.65 | 63.27% |
| West Fork Butte Creek | 9.38 | 3.44 | 63.39% |
| Willoughby Creek | 8.64 | 2.68 | 69.01% |
| Willow Creek | 14.68 | 5.03 | 65.71% |
| **Total** | **709.72** | **246.35** | **65.29%** |

# ATTACHMENT A - WEPP:ROAD MODELING RESULTS FOR FIELD ASSESSED ROAD CROSSINGS

**Table A-1. WEPP:Road Modeling Results From Field Assessed Crossings – Valley Crossings**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Valley Crossings** | | | | | | | | | | | | | | | | | |
| EMC-V15 | Stevensville | Sandy loam | 50 | Insloped, bare ditch | graveled high | 3 | 828 | 24 | 84 | 2 | 0.3 | 1 | 80 | 0.2 | 0 | 301 | 306 |
| BFBRS-V27 | Stevensville | Sandy loam | 50 | Insloped, bare ditch | graveled high | 0.5 | 35 | 20 | 25 | 8 | 0.3 | 1 | 5 | 0.1 | 0 | 9 | 5 |
| BFBRS-V28 | Stevensville | Silty Loam | 50 | Outsloped, rutted | graveled high | 0.5 | 264 | 20 | 58 | 7 | 0.3 | 1 | 2 | 0.3 | 0 | 84 | 90 |
| BRSC-V31 | Stevensville | Silty Loam | 50 | Insloped, vegetated or rocked ditch | graveled low | 5 | 330 | 20.5 | 100 | 5.5 | 0.3 | 1 | 10 | 0.4 | 0 | 131 | 117 |
| BFBRS-V32 | Stevensville | Silty Loam | 50 | Insloped, bare ditch | graveled high | 1.5 | 64 | 10 | 70 | 11 | 0.3 | 1 | 25 | 0.2 | 0 | 18 | 13 |
| BRCC-V113 | Stevensville | Silty Loam | 50 | Insloped, bare ditch | graveled high | 0.5 | 419 | 24 | 120 | 8 | 0.3 | 1 | 10 | 0.3 | 0 | 227 | 202 |
| BRCC-V114 | Stevensville | Silty Loam | 50 | Insloped, vegetated or rocked ditch | graveled high | 1 | 700 | 34 | 27 | 6 | 0.3 | 1 | 10 | 0.3 | 0 | 234 | 246 |
| BRCC-V137 | Stevensville | Silty Loam | 50 | Insloped, bare ditch | graveled high | 2 | 120 | 18 | 20 | 1 | 0.3 | 1 | 5 | 0.4 | 0 | 55 | 42 |
| LRC-V142 | Stevensville | Silty Loam | 50 | Insloped, bare ditch | graveled high | 7 | 322 | 22 | 10 | 1 | 0.3 | 1 | 15 | 0.5 | 0 | 611 | 551 |
| BRD-V144 | Stevensville | Sandy loam | 50 | Insloped, bare ditch | graveled high | 2 | 700 | 13 | 87 | 4 | 0.3 | 1 | 40 | 0.2 | 0 | 101 | 116 |
| BRLC-V195 | Stevensville | Sandy loam | 50 | Outsloped, rutted | graveled low | 0.3 | 10 | 10 | 28 | 15 | 0.3 | 1 | 60 | 0 | 0 | 0 | 0 |
| **Valley Results** | | | | | | | **326** | | | | | | | | | **Mean (t/yr)** | **0.07** |
| | | | | | | | | | | | | | | **25th** | **0.006** | **Median** | **0.05** |
| | | | | | | | | | | | | | | **75th** | **0.11** | **Maximum** | **0.28** |
| | | | | | | | | | | | | | | | | **Minimum** | **0.00** |

**Table A-2. WEPP:Road Modeling Results From Field Assessed Crossings – Mountain Crossings**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mountain Crossings** | | | | | | | | | | | | | | | | | |
| BRHC-M1 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 1.5 | 384 | 16 | 40 | 2 | 0.3 | 1 | 25 | 1.6 | 3.1 | 101 | 80 |
| BRHC-M1 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 8 | 137 | 16 | 40 | 2 | 0.3 | 1 | 25 | | | | |
| BRHC-M2 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled high | 7 | 490 | 18 | 120 | 4 | 0.3 | 1 | 60 | 0.1 | 0 | 341 | 313 |
| BRHC-M3 | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native high | 5 | 520 | 13 | 100 | 8 | 0.3 | 1 | 50 | 1.8 | 2.7 | 3675 | 2730 |
| BRHC-M4 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native high | 3 | 250 | 14 | 100 | 10 | 0.3 | 1 | 30 | 0.7 | 1.1 | 245 | 186 |
| BRHC-M7 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled low | 6 | 626 | 22 | 100 | 35 | 0.3 | 1 | 75 | 0.1 | 0 | 200 | 184 |
| MC-M8 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled low | 0.5 | 40 | 10 | 70 | 5 | 0.3 | 1 | 50 | 0.1 | 0 | 1 | 1 |
| MC-M9 | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | graveled high | 2 | 470 | 12 | 45 | 4 | 0.3 | 1 | 50 | 0.2 | 0 | 76 | 72 |
| MC-M9 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled high | 2 | 470 | 12 | 45 | 4 | 0.3 | 1 | 50 | | | | |
| BRNWC-M11 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 6 | 463 | 10 | 84 | 38 | 0.3 | 1 | 25 | 0.5 | 0.6 | 428 | 353 |
| BRNWC-M12 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled high | 5 | 575 | 17.5 | 50 | 7 | 0.3 | 1 | 15 | 0.3 | 0 | 596 | 545 |
| EMC-M16 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 5 | 483 | 11 | 58 | 5 | 5 | 20 | 40 | 0.3 | 0.6 | 432 | 203 |
| EMC-M17 | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native low | 4 | 200 | 12 | 120 | 12 | 0.3 | 1 | 90 | 1.1 | 1.5 | 324 | 200 |
| EMC-M18 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled low | 7 | 630 | 12 | 47 | 4 | 0.3 | 30 | 80 | 0 | 0 | 83 | 19 |
| TMC-M20 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 0.5 | 130 | 10 | 45 | 3 | 0.3 | 1 | 5 | 0.5 | 0.8 | 9 | 6 |
| AC-M24 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native high | 2 | 175 | 15 | 65 | 17 | 0.3 | 1 | 25 | 0.4 | 0.4 | 89 | 72 |
| AC-M25 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native high | 8 | 116 | 19 | 62 | 8 | 0.3 | 1 | 20 | 0.5 | 0.5 | 126 | 83 |
| LLC-M29 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native low | 3 | 79 | 14 | 58 | 10 | 0.3 | 1 | 10 | 0.1 | 0 | 10 | 1 |

**Table A-2. WEPP:Road Modeling Results From Field Assessed Crossings – Mountain Crossings**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mountain Crossings** | | | | | | | | | | | | | | | | | |
| LLC-M30 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native low | 6 | 138 | 14.5 | 90 | 18 | 0.3 | 1 | 20 | 0.1 | 0 | 37 | 12 |
| LLC-M30 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native low | 2 | 120 | 14.5 | 90 | 18 | 0.3 | 1 | 20 | | | | |
| MC-M33 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 9 | 60 | 16 | 70 | 13 | 0.3 | 1 | 10 | 0.2 | 0 | 14 | 11 |
| MC-M33 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 2.5 | 78 | 16 | 70 | 13 | 0.3 | 1 | 10 | | | | |
| MC-M34 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 8 | 234 | 13 | 120 | 20 | 0.3 | 1 | 35 | 0.2 | 0.1 | 91 | 80 |
| MC-M35 | Lolo Hot Springs | Sandy Loam | 30 | Insloped, bare ditch | native low | 4 | 357 | 19 | 120 | 19 | 0.3 | 1 | 40 | 0.2 | 0.1 | 219 | 194 |
| BRSC-M36 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native low | 7 | 166 | 17 | 100 | 20 | 0.3 | 1 | 25 | 0.1 | 0 | 16 | 14 |
| BC-M39 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native high | 7 | 300 | 22 | 150 | 10 | 0.3 | 1 | 25 | 0.1 | 0 | 111 | 74 |
| BRSC-M40 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 8.5 | 400 | 19 | 82 | 9 | 0.3 | 1 | 25 | 0.8 | 1.5 | 950 | 714 |
| BC-M41 | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native none | 1.5 | 16 | 17 | 70 | 10 | 0.3 | 1 | 25 | 0 | 0 | 3 | 0 |
| LLC-M44 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native high | 8 | 435 | 16 | 70 | 25 | 0.3 | 1 | 60 | 2.1 | 3 | 6223 | 4,846 |
| LLC-M44 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native high | 5 | 435 | 16 | 46 | 25 | 0.3 | 1 | 40 | | | | |
| LLC-M45 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native high | 5 | 540 | 14 | 90 | 35 | 0.3 | 1 | 40 | 0.8 | 1.2 | 2553 | 2068 |
| LLC-M46 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 3 | 117 | 9 | 82 | 15 | 0.3 | 1 | 35 | 0.2 | 0.2 | 22 | 19 |
| LLC-M46 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 1 | 130 | 9 | 82 | 15 | 0.3 | 1 | 35 | | | | |
| LLC-M47 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native low | 1 | 112 | 14.5 | 58 | 28 | 0.3 | 1 | 70 | 0.1 | 0 | 11 | 6 |
| ULC-M48 | Lolo Hot Springs | Sandy Loam | 30 | Insloped, vegetated or rocked ditch | graveled high | 8 | 97 | 13 | 100 | 10 | 0.3 | 1 | 30 | 0.4 | 0 | 52 | 44 |
| ULC-M48 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | graveled high | 8 | 50 | 13 | 100 | 10 | 0.3 | 1 | 30 | | | | |
| HC-M49 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native high | 1 | 67 | 20 | 51 | 9 | 0.3 | 1 | 35 | 0.1 | 0 | 14 | 5 |
| ULC-M56 | Lolo Hot Springs | Sandy Loam | 30 | Insloped, vegetated or rocked ditch | native high | 9 | 154 | 16 | 70 | 12 | 0.3 | 1 | 25 | 0.2 | 0.1 | 59 | 56 |
| ULC-M57 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native none | 4 | 40 | 24 | 83 | 30 | 0.3 | 1 | 40 | 0.1 | 0 | 6 | 2 |
| WFBC-M58 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native none | 3 | 188 | 20 | 81 | 12 | 0.3 | 1 | 10 | 0.3 | 0.7 | 35 | 19 |
| LCGC-M59 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native none | 9 | 314 | 16 | 53 | 12 | 0.3 | 1 | 20 | 0.7 | 1.4 | 337 | 212 |
| LCGC-M59 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native none | 7 | 45 | 16 | 53 | 12 | 0.3 | 1 | 20 | | | | |
| WFBC-M64 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native none | 5 | 469 | 27.5 | 70 | 22 | 0.3 | 1 | 20 | 0.38 | 0.04 | 993.96 | 793 |
| WFBC-M64_2 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled high | 10 | 540 | 12 | 70 | 22 | 0.3 | 1 | 20 | | | | |
| SFLC-M65 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native none | 0.3 | 48 | 10 | 100 | 15 | 0.3 | 1 | 45 | 0 | 0.1 | 0 | 0 |
| WFBC-M66 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native none | 1 | 30 | 12 | 0.3 | 1 | 0.3 | 1 | 0 | 0.1 | 0.2 | 3 | 1 |
| SFLC-M67 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native high | 3 | 240 | 12 | 120 | 11 | 0.3 | 1 | 25 | 0.7 | 0.9 | 579 | 211 |
| SFLC-M67 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native high | 6 | 780 | 12 | 120 | 11 | 0.3 | 1 | 25 | | | | |
| WFBC-M68 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled low | 6 | 654 | 22 | 79 | 20 | 0.3 | 1 | 20 | 0.3 | 0 | 368 | 340 |
| WFBC-M73 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native none | 7 | 394 | 12 | 100 | 11 | 0.3 | 1 | 50 | 1.6 | 2.7 | 434 | 323 |
| SFLC-M74 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native low | 4 | 153 | 24 | 80 | 24 | 0.3 | 1 | 60 | 0.2 | 0.1 | 39 | 39 |
| LCGC-M75 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native none | 4 | 462 | 19 | 83 | 20 | 0.3 | 1 | 85 | 0.1 | 0.1 | 102 | 15 |
| LCGC-M76 | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native high | 2 | 84 | 14 | 83 | 13 | 0.3 | 40 | 25 | 0.2 | 0.1 | 101 | 22 |
| LCGC-M76 | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native high | 10 | 45 | 15 | 83 | 13 | 0.3 | 1 | 25 | | | | |
| LCGC-M77 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 3 | 76 | 7 | 70 | 7 | 0.3 | 1 | 40 | 0.5 | 0.6 | 9 | 6 |
| NFHC-M78 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 7 | 58 | 12 | 70 | 28 | 0.3 | 1 | 60 | 0.3 | 0.1 | 31 | 20 |
| LCGC-M79 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 1 | 184 | 11 | 47 | 20 | 0.3 | 1 | 75 | 1.4 | 1.3 | 128 | 92 |
| LCGC-M79 | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native low | 2 | 103 | 11.5 | 70 | 22 | 0.3 | 1 | 60 | | | | |

**Table A-2. WEPP:Road Modeling Results From Field Assessed Crossings – Mountain Crossings**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mountain Crossings** | | | | | | | | | | | | | | | | | |
| LBFBR-M80 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 1 | 58 | 12 | 58 | 13 | 0.3 | 1 | 40 | 0.3 | 0.2 | 9 | 6 |
| LBFBR-M84 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 0.3 | 3 | 17 | 31 | 12 | 0.3 | 1 | 70 | 0 | 0 | 0 | 0 |
| LBFBR-M85 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled low | 1 | 47 | 16 | 70 | 7 | 0.3 | 1 | 60 | 0.1 | 0 | 2 | 2 |
| LBFBR-M86 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled high | 3 | 264 | 13 | 70 | 13 | 0.3 | 1 | 25 | 1.4 | 1.4 | 177 | 136 |
| LBFBR-M86 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled high | 1 | 243 | 18 | 0.3 | 1 | 0.3 | 1 | 25 | | | | |
| LBFBR-M86 | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | graveled low | 9 | 118 | 9 | 0.3 | 1 | 0.3 | 1 | 25 | | | | |
| LBFBR-M86 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 8 | 130 | 8.5 | 0.3 | 1 | 0.3 | 1 | 25 | | | | |
| BC-M87 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled low | 9 | 140 | 14 | 70 | 17 | 0.3 | 1 | 75 | 0.1 | 0 | 18 | 18 |
| BRLiC-M91 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native high | 2 | 52 | 14 | 80 | 19 | 0.3 | 1 | 35 | 0.1 | 0 | 23 | 4 |
| BRLiC-M92 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native none | 5 | 180 | 10 | 70 | 12 | 0.3 | 1 | 25 | 0.4 | 0.8 | 35 | 21 |
| BRD-M93 | Lolo Hot Springs | Loam | 30 | Outsloped, rutted | native low | 3 | 175 | 15 | 100 | 14 | 0.3 | 1 | 10 | 0.5 | 0.5 | 82 | 58 |
| BRW-M96 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | graveled high | 8 | 491 | 24 | 80 | 8 | 0.3 | 1 | 20 | 0.3 | 0.1 | 741 | 668 |
| WC-M97 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native high | 3.5 | 182 | 18 | 120 | 8 | 0.3 | 1 | 80 | 0.6 | 0.2 | 225 | 76 |
| WC-M97_2 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native high | 4 | 170 | 18 | 120 | 8 | 0.3 | 1 | 80 | | | | |
| LRC-M106 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 3 | 258 | 15 | 60 | 12 | 0.3 | 1 | 10 | 0.5 | 0.7 | 82 | 64 |
| MSCC-M111 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native none | 6 | 108 | 14 | 80 | 13 | 0.3 | 1 | 40 | 0.8 | 1.2 | 33 | 14 |
| MSCC-M111 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native none | 4 | 90 | 14 | 80 | 13 | 0.3 | 1 | 40 | | | | |
| LSCC-M112 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native low | 6 | 195 | 19 | 120 | 11 | 0.3 | 1 | 35 | 0.2 | 0.1 | 49 | 27 |
| LRC-M115 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | graveled high | 6 | 198 | 25 | 100 | 18 | 0.3 | 1 | 65 | 0.1 | 0 | 91 | 87 |
| URC-M116 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native none | 1 | 266 | 9 | 55 | 12 | 0.3 | 1 | 20 | 0.5 | 1 | 20 | 11 |
| URC-M123 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native high | 8.5 | 203 | 25 | 85 | 8 | 0.3 | 1 | 30 | 2.3 | 3.7 | 3367 | 2402 |
| URC-M123 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native high | 8.5 | 185 | 25 | 85 | 8 | 0.3 | 1 | 30 | | | | |
| URC-M123 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native high | 8.5 | 252 | 25 | 85 | 8 | 0.3 | 1 | 30 | | | | |
| URC-M124 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native high | 9 | 283 | 17 | 80 | 7 | 0.3 | 1 | 10 | 0.7 | 1.1 | 571 | 450 |
| URC-M125 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native high | 1 | 88 | 25 | 83 | 23 | 0.3 | 1 | 10 | 0 | 0 | 62 | 11 |
| LRC-M126 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native low | 4 | 160 | 18 | 95 | 19 | 0.3 | 1 | 50 | 0.5 | 0.2 | 237 | 201 |
| LRC-M126 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native low | 7 | 808 | 18 | 95 | 19 | 0.3 | 1 | 50 | | | | |
| LRC-M127 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native none | 5 | 183 | 10 | 60 | 13 | 0.3 | 1 | 45 | 0.7 | 1.4 | 42 | 24 |
| LRC-M128 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native low | 3.5 | 247 | 15 | 75 | 7 | 0.3 | 1 | 10 | 0.6 | 1 | 83 | 60 |
| USCC-M129 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native low | 3 | 160 | 17.5 | 55 | 6 | 0.3 | 1 | 10 | 0.5 | 0.7 | 40 | 27 |
| BRCC-M138 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native low | 2 | 255 | 14 | 84 | 8 | 0.3 | 1 | 5 | 0 | 0 | 10 | 4 |
| BRCC-M139 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 8 | 510 | 16 | 100 | 10 | 0.3 | 1 | 25 | 0.2 | 0.1 | 222 | 202 |
| BRD-M140 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native none | 6 | 50 | 10 | 0.3 | 1 | 0.3 | 1 | 30 | 0.4 | 0.9 | 7 | 2 |
| BRCC-M141 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 3 | 383 | 16 | 120 | 20 | 0.3 | 1 | 10 | 0.1 | 0.1 | 61 | 54 |
| LRC-M146 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | graveled low | 8 | 105 | 22 | 70 | 8 | 0.3 | 1 | 10 | 0.1 | 0 | 27 | 16 |
| BRD-M147 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 3 | 160 | 10 | 36 | 2 | 0.3 | 1 | 5 | 0.1 | 0.1 | 5 | 4 |

**Table A-2. WEPP:Road Modeling Results From Field Assessed Crossings – Mountain Crossings**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mountain Crossings** | | | | | | | | | | | | | | | | | |
| LSCC-M148 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 5 | 216 | 14 | 46 | 3 | 0.3 | 1 | 10 | 0.1 | 0.1 | 19 | 17 |
| MSC-M149 | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native low | 5 | 90 | 14 | 84 | 15 | 0.3 | 1 | 5 | 0.8 | 1.1 | 168 | 127 |
| MSC-M149 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 5 | 275 | 14 | 84 | 7 | 0.3 | 1 | 5 | | | | |
| MSC-M150 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 6 | 200 | 10 | 60 | 20 | 0.3 | 1 | 25 | 0.5 | 0.5 | 74 | 59 |
| DC-M151 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 5 | 700 | 16 | 65 | 3 | 0.3 | 1 | 10 | 0.8 | 1.6 | 834 | 715 |
| USC-M152 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 4 | 180 | 15 | 82 | 5 | 0.3 | 1 | 20 | 0.6 | 1.1 | 58 | 43 |
| USC-M158 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 6 | 540 | 16 | 58 | 10 | 0.3 | 1 | 5 | 0.7 | 1.2 | 656 | 527 |
| DIVC-M159 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled low | 3 | 330 | 16 | 84 | 7.5 | 0.3 | 1 | 10 | 0.3 | 0 | 53 | 46 |
| WC-M170 | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | native low | 6 | 250 | 19 | 75 | 14 | 0.3 | 1 | 25 | 0.2 | 0.1 | 61 | 62 |
| WC-M171 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled low | 7.5 | 405 | 14 | 70 | 35 | 0.3 | 1 | 15 | 0.2 | 0 | 141 | 146 |
| LLC-M172 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native none | 1.5 | 121 | 16 | 80 | 24 | 0.3 | 1 | 30 | 0.4 | 0.4 | 59 | 36 |
| LLC-M172 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 1.5 | 107 | 16 | 80 | 24 | 0.3 | 1 | 30 | | | | |
| LLC-M173 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native low | 3 | 166 | 18 | 82 | 18 | 0.3 | 1 | 55 | 0.2 | 0.1 | 26 | 17 |
| BRNWC-M174 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 10 | 150 | 9.5 | 40 | 3 | 0.3 | 1 | 20 | 0.7 | 1.3 | 62 | 42 |
| TCC-M181 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 2 | 178 | 13 | 76 | 17 | 0.3 | 1 | 20 | 0.4 | 0.4 | 53 | 38 |
| BRD-M182 (US) | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native low | 1 | 57 | 21 | 82 | 26 | 0.3 | 1 | 20 | 0.9 | 1.7 | 79 | 46 |
| BRD-M182 (DS) | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native low | 6 | 238 | 21.5 | 0.3 | 1 | 0.3 | 1 | 25 | | | | |
| LLC-M191 | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | native none | 5 | 190 | 14 | 95 | 14 | 0.3 | 1 | 45 | 0.1 | 0.1 | 32 | 4 |
| **Mountain Results** | | | | | | | **240.57** | | | | | | | | | **Mean (t/yr)** | **0.12** |
| | | | | | | | | | | | | | | **25th** | **0.007** | **Median** | **0.02** |
| | | | | | | | | | | | | | | **75th** | **0.09** | **Maximum** | **2.42** |
| | | | | | | | | | | | | | | | | **Minimum** | **0.00** |

**Table A-3. WEPP:Road Modeling Results From Field Assessed Crossings – Foothill Crossings**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Foothill Crossings** | | | | | | | | | | | | | | | | | |
| BRNWC-F14 | Darby | Silty Loam | 50 | Insloped, vegetated or rocked ditch | native low | 7 | 415 | 12 | 58 | 4 | 0.3 | 1 | 35 | 2.5 | 0.8 | 300 | 253 |
| BRNWC-F14 | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 7 | 175 | 10 | 58 | 4 | 0.3 | 1 | 35 | | | | |
| TMC-F19 | Darby | Sandy Loam | 50 | Outsloped, unrutted | graveled high | 1 | 454 | 16 | 119 | 4 | 0.3 | 1 | 10 | 0.1 | 0 | 104 | 25 |
| TMC-F22 | Darby | Sandy Loam | 50 | Outsloped, unrutted | graveled high | 8 | 1000 | 12 | 100 | 4 | 1 | 5 | 10 | 0 | 0 | 331 | 18 |
| TMC-F22 (2) | Darby | Sandy Loam | 50 | Outsloped, unrutted | graveled high | 8 | 50 | 12 | 100 | 4 | 1 | 5 | 10 | | | | |
| BRLC-F23 (1) | Darby | Sandy Loam | 50 | Outsloped, unrutted | graveled high | 1 | 284 | 21 | 84 | 6 | 0.3 | 1 | 20 | 0.2 | 0 | 189 | 60 |
| BRLC-F23 (2) | Darby | Sandy Loam | 50 | Outsloped, unrutted | graveled high | 2 | 370 | 21 | 84 | 6 | 0.3 | 1 | 20 | | | | |
| TMC-F26 | Darby | Sandy Loam | 50 | Outsloped, rutted | graveled high | 1 | 483 | 20 | 84 | 11 | 0.3 | 1 | 5 | 0.2 | 0 | 42 | 72 |
| BRSC-F37 | Darby | Silty Loam | 50 | Insloped, bare ditch | graveled high | 4 | 312 | 20.5 | 70 | 10.5 | 0.3 | 1 | 20 | 0.5 | 0 | 365 | 304 |
| BRSC-F37 | Darby | Silty Loam | 50 | Insloped, bare ditch | graveled high | 0.5 | 156 | 20.5 | 70 | 10.5 | 0.3 | 1 | 20 | | | | |
| BRSC-F38 | Darby | Silty Loam | 50 | Outsloped, unrutted | graveled high | 7 | 935 | 13 | 150 | 7 | 0.3 | 1 | 35 | 0.1 | 0 | 353 | 136 |
| BRBC-F42 | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 7 | 330 | 10 | 58 | 13 | 0.3 | 1 | 25 | 1.4 | 0.3 | 236 | 197 |
| BRBC-F42 | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 1 | 150 | 10 | 58 | 13 | 0.3 | 1 | 25 | | | | |
| BRBC-F43 | Darby | Sandy Loam | 50 | Insloped, bare ditch | graveled high | 0.5 | 240 | 24 | 25 | 14 | 0.3 | 1 | 50 | 0.1 | 0 | 20 | 23 |

**Table A-3. WEPP:Road Modeling Results From Field Assessed Crossings – Foothill Crossings**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MC-F88 | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 11 | 259 | 12 | 70 | 4.5 | 0.3 | 1 | 30 | 1.9 | 0.5 | 298 | 238 |
| MC-F88 | Darby | Silty Loam | 50 | Insloped, vegetated or rocked ditch | native low | 4 | 119 | 12 | 70 | 4.5 | 0.3 | 1 | 30 | | | | |
| MC-F89 | Darby | Silty Loam | 50 | Outsloped, unrutted | native high | 3 | 125 | 14 | 47 | 14 | 0.3 | 1 | 20 | 0.7 | 0.2 | 375 | 258 |
| MC-F89 | Darby | Silty Loam | 50 | Insloped, vegetated or rocked ditch | native high | 2 | 551 | 14 | 47 | 14 | 0.3 | 1 | 20 | | | | |
| MC-F89A | Darby | Silty Loam | 50 | Insloped, vegetated or rocked ditch | native high | 7 | 836 | 14 | 70 | 8 | 0.3 | 1 | 20 | 1.1 | 0.3 | 2368 | 2162 |
| BRBC-F90 | Darby | Silty Loam | 50 | Outsloped, rutted | graveled high | 2 | 512 | 24 | 58 | 8 | 0.3 | 1 | 20 | 0.3 | 0 | 196 | 199 |
| BRLiC-F94 | Darby | Silty Loam | 50 | Outsloped, unrutted | graveled high | 3 | 410 | 26 | 100 | 5 | 0.3 | 1 | 20 | 0.1 | 0 | 297 | 101 |
| BRLiC-F95 | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 7 | 320 | 15 | 90 | 15 | 0.3 | 1 | 45 | 2.2 | 0.6 | 719 | 582 |
| BRLiC-F95 | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 5 | 115 | 15 | 90 | 15 | 0.3 | 1 | 45 | | | | |
| BRBC-F102 (1) | Darby | Sandy Loam | 50 | Outsloped, unrutted | graveled high | 3 | 175 | 21 | 70 | 12 | 0.3 | 1 | 35 | 0.2 | 0 | 236 | 117 |
| BRBC-F102 (2) | Darby | Sandy Loam | 50 | Outsloped, unrutted | graveled high | 6 | 500 | 21 | 70 | 12 | 0.3 | 1 | 35 | | | | |
| BRBC-F103 | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 4 | 79 | 31 | 90 | 17 | 0.3 | 1 | 60 | 2.7 | 0.8 | 4196 | 3,578 |
| BRBC-F103 | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 7 | 581 | 31 | 90 | 17 | 0.3 | 1 | 60 | | | | |
| BRBC-F103 Driveway | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 12 | 570 | 11 | 0.3 | 1 | 0.3 | 1 | 0 | 1.2 | 0.3 | 783 | 657 |
| WC-F104 | Darby | Silty Loam | 50 | Outsloped, unrutted | native high | 4.5 | 107 | 13 | 70 | 23 | 0.3 | 1 | 40 | 0.1 | 0 | 64 | 12 |
| BRW-F105 | Darby | Silty Loam | 50 | Insloped, vegetated or rocked ditch | graveled high | 1.5 | 176 | 24 | 79 | 14 | 0.3 | 1 | 20 | 0.2 | 0 | 88 | 65 |
| BRCC-F136 | Darby | Sandy Loam | 50 | Outsloped, rutted | native low | 5 | 207 | 12 | 56 | 8 | 0.3 | 1 | 10 | 0.1 | 0 | 19 | 16 |
| LRC-F143 | Darby | Sandy Loam | 50 | Insloped, bare ditch | graveled high | 1 | 100 | 29 | 150 | 1 | 0.3 | 1 | 20 | 0.3 | 0 | 25 | 22 |
| BRD-F145 | Darby | Sandy Loam | 50 | Outsloped, unrutted | native low | 5 | 153 | 12 | 56 | 3 | 0.3 | 1 | 10 | 0 | 0 | 7 | 3 |
| BRD-F160 | Darby | Silty Loam | 50 | Insloped, bare ditch | graveled high | 5 | 60 | 42 | 56 | 30 | 0.3 | 1 | 25 | 0.1 | 0 | 82 | 48 |
| BRLC-F162 | Darby | Silty Loam | 50 | Insloped, bare ditch | graveled high | 1 | 110 | 24 | 150 | 1 | 0.3 | 1 | 5 | 0.3 | 0 | 48 | 33 |
| BRW-F168 | Darby | Silty Loam | 50 | Outsloped, unrutted | graveled high | 4 | 1000 | 29 | 140 | 100 | 0.3 | 1 | 5 | 0 | 0 | 950 | 502 |
| WC-F169 | Darby | Silty Loam | 50 | Outsloped, unrutted | graveled high | 6 | 400 | 16 | 75 | 6 | 0.3 | 1 | 15 | 0.1 | 0 | 224 | 68 |
| BRLiC-F186 (DS) | Darby | Silty Loam | 50 | Insloped, vegetated or rocked ditch | native high | 5 | 900 | 24 | 0.3 | 1 | 0.3 | 1 | 20 | | | | |
| BRLiC-F186 (US) | Darby | Silty Loam | 50 | Outsloped, unrutted | native high | 4 | 175 | 23.5 | 75 | 19 | 0.3 | 1 | 20 | 1.2 | 0.3 | 2,235 | 1,810 |
| BRLiC-F187 | Darby | Silty Loam | 50 | Outsloped, unrutted | native high | 8 | 315 | 24 | 100 | 12 | 0.3 | 1 | 20 | 0.2 | 0 | 530 | 194 |
| BRW-F188 | Darby | Silty Loam | 50 | Insloped, bare ditch | graveled high | 5 | 450 | 21.5 | 15 | 19 | 0.3 | 1 | 40 | 0.3 | 0 | 438 | 383 |
| BRW-F188 | Darby | Silty Loam | 50 | Insloped, bare ditch | graveled high | 3 | 210 | 21.5 | 15 | 19 | 0.3 | 1 | 40 | | | | |
| McC-F189 | Darby | Silty Loam | 50 | Insloped, vegetated or rocked ditch | graveled high | 7 | 660 | 34 | 85 | 7 | 0.3 | 1 | 25 | 0.4 | 0 | 1439 | 1334 |
| McC-F190 | Darby | Silty Loam | 50 | Insloped, vegetated or rocked ditch | graveled high | 3 | 450 | 29 | 120 | 4 | 0.3 | 1 | 30 | 0.3 | 0 | 216 | 189 |
| BC-F192 | Darby | Sandy Loam | 50 | Insloped, bare ditch | graveled high | 4 | 437 | 30 | 150 | 4 | 0.3 | 1 | 15 | 0.3 | 0 | 520 | 473 |
| BRLC-F193 | Darby | Sandy Loam | 50 | Insloped, vegetated or rocked ditch | graveled high | 6 | 970 | 26 | 110 | 5 | 0.3 | 1 | 15 | 0.3 | 0 | 1048 | 989 |
| SC-F194 | Darby | Sandy Loam | 50 | Insloped, bare ditch | graveled high | 2 | 212 | 25 | 50 | 14 | 0.3 | 1 | 45 | 0.2 | 0 | 42 | 59 |
| **Foothill Results** | | | | | | | **369.1** | | | | | | | | | **Mean (t/yr)** | **0.22** |
| | | | | | | | | | | | | | | **25th** | **0.030** | **Median** | **0.09** |
| | | | | | | | | | | | | | | **75th** | **0.24** | **Maximum** | **1.79** |
| | | | | | | | | | | | | | | | | **Minimum** | **0.00** |

**Table A-4. WEPP:Road Modeling Results From Field Assessed Crossings – Total Crossing Data**

| Total Crossing Data | Road length (ft) | | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|
| | | | | | Mean (t/yr) | 0.14 |
| | 283.36 | | | | 25th | 0.007 | Median | 0.03 |
| | | | | | 75th | 0.10 | Maximum | 2.42 |
| | | | | | | | Minimum | 0.00 |

**Table A-5. WEPP: Road Modeling Results From Field Assessed Parallel Segments – Foothill Parallel**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Foothill Parallel** | | | | | | | | | | | | | | | | | |
| BRNWC-F13P | Darby | Silty Loam | 50 | Outsloped, rutted | graveled high | 6 | 1000 | 14.5 | 0.3 | 1 | 0.3 | 45 | 25 | 0 | 0 | 1688 | 46 |
| BRBC-F131P | Darby | Silty Loam | 50 | Outsloped, unrutted | native low | 9 | 1000 | 16.5 | 100 | 10 | 5 | 20 | 45 | 0 | 0 | 410 | 0 |
| BRBC-F132P | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 5 | 1000 | 20 | 95 | 19 | 0.3 | 1 | 25 | 1.6 | 0.4 | 1696 | 737 |
| BRBC-F133P | Darby | Silty Loam | 50 | Outsloped, unrutted | native low | 8 | 1000 | 18 | 100 | 12 | 0.3 | 1 | 70 | 0.8 | 0.2 | 406 | 163 |
| BRBC-F134P | Darby | Silty Loam | 50 | Outsloped, unrutted | native low | 5 | 1000 | 18 | 0.3 | 1 | 8 | 25 | 45 | 0 | 0 | 250 | 0 |
| BRBC-F135P | Darby | Silty Loam | 50 | Insloped, bare ditch | native low | 5 | 1000 | 25 | 0.3 | 1 | 6 | 450 | 45 | 0 | 0 | 2580 | 0 |
| BRLC-F161P | Darby | Silty Loam | 50 | Insloped, bare ditch | graveled high | 2 | 750 | 27 | 65 | 6 | 27 | 75 | 5 | 0 | 0 | 806 | 170 |
| BRNWC-F176P | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 6 | 528 | 12 | 90 | 30 | 6 | 60 | 20 | 0 | 0 | 797 | 60 |
| BRNWC-F177P | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 4 | 528 | 13 | 1 | 120 | 6 | 50 | 20 | 0 | 0 | 209 | 10 |
| BRNWC-F178P | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 4 | 528 | 13 | 1 | 120 | 75 | 35 | 20 | 0 | 0 | 211 | 33 |
| BRNWC-F179P | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 4 | 528 | 13 | 1 | 60 | 75 | 40 | 20 | 0 | 0 | 229 | 62 |
| BRNWC-F180P | Darby | Silty Loam | 50 | Outsloped, rutted | native low | 3 | 528 | 12 | 2 | 21 | 17 | 180 | 20 | 0 | 0 | 152 | 1 |
| BRD-F183P | Darby | Silty Loam | 50 | Outsloped, unrutted | native high | 9 | 1000 | 19 | 85 | 9 | 0.5 | 2 | 25 | 0.2 | 0 | 2328 | 260 |
| BRD-F184P | Darby | Silty Loam | 50 | Outsloped, unrutted | native high | 9 | 1000 | 21 | 58 | 18 | 0.3 | 1 | 25 | 0.4 | 0 | 2580 | 386 |
| BRD-F185P | Darby | Silty Loam | 50 | Outsloped, unrutted | native high | 9 | 1000 | 24 | 110 | 12 | 1 | 10 | 25 | 0 | 0 | 3394 | 58 |
| Foothill Results | | | | | | | | | | | Mean | 66.33 | | | | **Mean (t/yr)** | **0.07** |
| | | | | | | | | | | | Median | 35 | | **25th** | **0.003** | **Median** | **0.03** |
| | | | | | | | | | | | | | | **75th** | **0.08** | **Maximum** | **0.37** |
| | | | | | | | | | | | | | | | | **Minimum** | **0.00** |

**Table A-6. WEPP: Road Modeling Results From Field Assessed Parallel Segments – Mountain Parallel**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mountain Parallel** | | | | | | | | | | | | | | | | | |
| BRHC-M4P | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native high | 2 | 290 | 7 | 75 | 75 | 10 | 10 | 30 | 0.1 | 0.1 | 270 | 119 |
| BRHC-M4P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native high | 2 | 290 | 7 | 75 | 75 | 10 | 10 | 30 | 0.1 | 0.1 | 136 | 86 |
| BRHC-M5P | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native high | 5 | 998 | 23 | 44 | 3 | 15 | 5 | 20 | 0.7 | 1.6 | 13978 | 10995 |
| OC-M6P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 4 | 196 | 10 | 34 | 4 | 20 | 30 | 30 | 0.1 | 0 | 39 | 12 |
| EMC-M16P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 5 | 240 | 11 | 84 | 10 | 10 | 10 | 40 | 0.3 | 0.5 | 164 | 86 |
| TMC-M21P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled high | 7 | 400 | 10 | 84 | 12 | 10 | 11 | 10 | 0.1 | 0 | 349 | 182 |
| END M21P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | graveled high | 7 | 400 | 10 | 58 | 3 | 8 | 10 | 10 | 0.1 | 0 | 339 | 188 |
| AC-M25P | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native high | 8 | 240 | 16 | 58 | 22 | 2 | 6.5 | 30 | 0.3 | 0.3 | 1220 | 272 |
| AC-M25 Pt END | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native high | 8 | 368 | 16 | 84 | 21 | 1 | 10 | 30 | 0.3 | 0.4 | 3225 | 518 |
| ULC-M48P | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, rutted | graveled high | 10 | 291 | 18 | 80 | 11 | 2 | 3 | 70 | 0.2 | 0 | 316 | 261 |
| HC-M51P | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native high | 2 | 1000 | 15 | 120 | 21 | 1 | 10 | 60 | 0 | 0 | 292 | 0 |
| HC-M52P | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native high | 6 | 1000 | 15 | 120 | 30 | 1 | 12 | 60 | 0 | 0 | 428 | 6 |
| HC-M53P | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native high | 5 | 1000 | 18 | 150 | 10 | 0.5 | 70 | 0 | 0 | 0 | 180 | 0 |
| HC-M54P | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native high | 5 | 1000 | 20 | 150 | 12 | 0.3 | 50 | 60 | 0 | 0 | 514 | 0 |
| HC-M55P | Lolo Hot Springs | Sandy Loam | 30 | Outsloped, unrutted | native high | 6 | 1000 | 24 | 46 | 16 | 1 | 35 | 35 | 0 | 0 | 446 | 0 |
| LCGC-M61P | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native none | 8 | 500 | 13 | 45 | 30 | 0.3 | 1 | 30 | 0.5 | 1.2 | 154 | 104 |
| LCGC-M62P | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native none | 9 | 500 | 12 | 70 | 10 | 1 | 50 | 30 | 0.1 | 0.1 | 199 | 26 |
| LCGC-M63P | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native none | 8 | 500 | 12 | 65 | 20 | 0.3 | 1 | 30 | 0.7 | 1.5 | 142 | 84 |
| WFBC-M70Pt- 1 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | graveled high | 9 | 1000 | 35 | 90 | 40 | 0.3 | 1 | 40 | 0.4 | 0 | 4552 | 2,142 |
| WFBC-M71Pt- 2 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | graveled high | 10 | 1000 | 35 | 100 | 83 | 0.3 | 70 | 40 | 0 | 0 | 6222 | 310 |
| WFBC-M72Pt- 3 | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | graveled high | 11 | 1000 | 36 | 100 | 54 | 1 | 750 | 50 | 0 | 0 | 4470 | 0 |
| LBFBR-M81P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 2.5 | 1000 | 13 | 0.3 | 1 | 1 | 21 | 0 | 0.4 | 0.8 | 598 | 86 |
| LBFBR-M82P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 2 | 1000 | 12 | 46 | 27 | 0.3 | 28 | 80 | 0.8 | 1.4 | 1358 | 87 |
| LBFBR-M83P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 1.5 | 1000 | 11 | 30 | 28 | 0.3 | 200 | 60 | 0 | 0 | 300 | 0 |
| WC-M98P | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | native high | 9 | 1000 | 15 | 82 | 9 | 7 | 10 | 80 | 2.6 | 4.4 | 85406 | 13,792 |
| WC-M99P | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native high | 9 | 1000 | 28 | 150 | 18 | 0.3 | 1 | 15 | 1.6 | 3 | 29650 | 12,381 |
| WC-M100P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native high | 9 | 1000 | 28 | 0.3 | 1 | 1 | 150 | 20 | 0 | 0 | 72462 | 84 |
| WC-M101P | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | native high | 8 | 1000 | 14 | 8 | 44 | 1 | 10 | 20 | 0.6 | 1.2 | 9460 | 1,792 |
| LRC-M107P | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | graveled high | 8.5 | 1000 | 25 | 82 | 43 | 0.5 | 8 | 25 | 0.2 | 0 | 3900 | 1,296 |
| LRC-M108P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | graveled high | 13 | 1000 | 20 | 60 | 27 | 6 | 80 | 40 | 0 | 0 | 1494 | 0 |
| LRC-M109P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | graveled high | 10 | 1000 | 20 | 150 | 19 | 0.3 | 1 | 30 | 0.2 | 0 | 1346 | 415 |
| LRC-M110P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | graveled high | 10 | 1000 | 30 | 80 | 10 | 6 | 120 | 50 | 0 | 0 | 1366 | 0 |
| URC-M118P | Lolo Hot Springs | Sandy Loam | 30 | Insloped, vegetated or rocked ditch | native high | 5 | 1000 | 19 | 100 | 13 | 1 | 12 | 50 | 0.8 | 0.4 | 2620 | 330 |
| URC-M119P | Lolo Hot Springs | Sandy Loam | 30 | Insloped, vegetated or rocked ditch | native high | 4 | 1000 | 20 | 100 | 11 | 1 | 38 | 25 | 0 | 0 | 736 | 33 |

**Table A-6. WEPP: Road Modeling Results From Field Assessed Parallel Segments – Mountain Parallel**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mountain Parallel** | | | | | | | | | | | | | | | | | |
| URC-M120P | Lolo Hot Springs | Sandy Loam | 30 | Insloped, vegetated or rocked ditch | native low | 5 | 1000 | 17 | 110 | 16 | 1 | 6 | 55 | 1.2 | 0.8 | 1440 | 234 |
| URC-M121P | Lolo Hot Springs | Sandy Loam | 30 | Insloped, vegetated or rocked ditch | native low | 3 | 1000 | 18.5 | 120 | 12 | 1 | 115 | 55 | 0 | 0 | 980 | 3 |
| URC-M122P | Lolo Hot Springs | Sandy Loam | 30 | Insloped, vegetated or rocked ditch | native high | 4 | 1000 | 17 | 120 | 9 | 1 | 22 | 45 | 0.4 | 0.4 | 1228 | 99 |
| LLHC-M163P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 2 | 633 | 18 | 70 | 7 | 18 | 60 | 40 | 0.1 | 0.2 | 316 | 162 |
| ULHC-M164P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | native low | 0.3 | 1000 | 12 | 0.3 | 1 | 0.3 | 1 | 40 | 2.4 | 6.8 | 0 | 0 |
| ULHC-M165P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | graveled low | 0.3 | 500 | 16 | 90 | 20 | 0.3 | 1 | 40 | 0.1 | 0 | 33 | 20 |
| ULHC-M166P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | graveled low | 2 | 1000 | 14 | 75 | 4 | 7 | 45 | 20 | 0 | 0 | 106 | 0 |
| ULHC-M167P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, unrutted | graveled low | 3 | 450 | 16 | 60 | 7 | 45 | 16 | 40 | 0 | 0 | 33 | 9 |
| | | | | | | | | | | | Mean | 50.01 | | | | **Mean (t/yr)** | **0.55** |
| | | | | Mountain Results | | | | | | | Median | 11.5 | | **25th** | **0.002** | **Median** | **0.04** |
| | | | | | | | | | | | | | | **75th** | **0.13** | **Maximum** | **6.90** |
| | | | | | | | | | | | | | | | | **Minimum** | **0.00** |

**Table A-7. WEPP: Road Modeling Results From Field Assessed Parallel Segments – Mountain Parallel**

| Comment | Climate | Soil | Years | Design | Surface, traffic | Road grad (%) | Road length (ft) | Road width (ft) | Fill grad (%) | Fill length (ft) | Buff grad (%) | Buff length (ft) | Rock cont (%) | Average annual rain runoff (in) | Average annual snow runoff (in) | Average annual sediment leaving road (lb/yr) | Average annual sediment leaving buffer (lb/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Paved Segments** | | | | | | | | | | | | | | | | | |
| DC-M153P | Lolo Hot Springs | Silty Loam | 30 | Insloped, bare ditch | paved high | 2 | 1000 | 14.5 | 0.3 | 1 | 5 | 35 | 10 | 0.4 | 0.8 | 1182 | 217 |
| DC-M153P | Lolo Hot Springs | Silty Loam | 30 | Outsloped, rutted | paved high | 2 | 1000 | 14.5 | 0.3 | 1 | 5 | 35 | 10 | 0.4 | 0.8 | 0 | 0 |
| DC-M154P | Lolo Hot Springs | Silty Loam | 30 | Insloped, veg/rck ditch | paved high | 4 | 1000 | 25 | 100 | 7 | 0.3 | 1 | 20 | 3.6 | 6.4 | 2328 | 902 |
| DC-M155P | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | paved high | 4 | 1000 | 26 | 142 | 12 | 9 | 15 | 20 | 1.2 | 2 | 6280 | 1,418 |
| DC-M156P | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | paved high | 5 | 1000 | 23 | 150 | 9 | 5 | 3 | 20 | 6.4 | 11.6 | 15832 | 3,240 |
| DC-M157P | Lolo Hot Springs | Silty Loam | 30 | Insloped, vegetated or rocked ditch | paved high | 5 | 1000 | 24 | 150 | 20 | 5 | 5 | 20 | 1.8 | 2.8 | 9210 | 2,453 |

# ATTACHMENT B - WEPP:ROAD MODEL ADJUSTMENTS

**WEPP:Road Model Adjustments**

Heavily vegetated road conditions are not properly represented in the standard WEPP:Road assumption. As a result, William J. Elliott, author of the model, was consulted to determine how best to represent these roads within the confines of the model.

There are three traffic scenarios available in the model. For roads where vegetation has grown up on the edges, the no traffic scenario is most appropriate as this scenario grows a limited amount of vegetation on the road. It uses the same plant growth for the road that the high traffic used for the fillslope. The following table explains the model assumptions for the three traffic scenarios:

| Traffic | High | Low | None |
|---|---|---|---|
| Erodibility | 100% | 25% | 25% |
| Hydraulic Conductivity | 100% | 100% | 100% |
| Vegetation on Road Surface | 0 | 0 | 50% |
| Vegetation on fill | 50% | 50% | 100% Forested |
| Buffer | Forested | Forested | Forested |

Based on conversations with Dr. Elliott, it was not appropriate to use the forest buffer to describe the road as the hydraulic conductivity of the soil would be too high. However, the hydraulic conductivity of the fillslope would be reasonable to use to describe the road surface for a fully forested scenario. This means, for the fully vegetated/forested road surface scenario, minimize the road segment length, put the remainder of the road surface length and gradient into the fillslope box, and minimize the buffer length and gradient at stream crossings.

**Parallel Road Adjustments**

The WEPP:Road model has a maximum contributing road length of 1000-feet. According to Dr. Elliott, it is rare that the contributing road length ever exceeds this distance. As a result, any field assessed parallel road segment in excess of this distance was reduced to 1000-feet for modeling purposes.

**Road Crossing Model Adjustments**

Some road crossing locations had contributing road length on each side of the crossing, and road conditions were significantly different on each side. In these situations, each road segment was modeled separately and the two segments were then summed to get the total sediment load for the crossing. Also, some crossing locations were located at the convergence of two or more roads, with all roads contributing to sediment load at the crossing. In these cases, road segments were modeled separately and then summed to get the total sediment load for the crossing.

# ATTACHMENT C - FIELD ASSESSMENT SITE LOCATION DATA

| SITE ID | X | Y | Z |
|---|---|---|---|
| BRHC-M1 | -113.9284 | 46.8249 | 4067.0440 |
| BRHC-M2 | -113.9697 | 46.8286 | 3587.6109 |
| BRHC-M3 | -113.9737 | 46.8226 | 3926.1821 |
| BRHC-M4 | -113.9666 | 46.8139 | 4363.2244 |
| BRHC-M4P | -113.9666 | 46.8139 | 4363.2244 |
| BRHC-M5P | -113.9426 | 46.8212 | 3902.1949 |
| OC-M6P | -114.1697 | 46.8519 | 3572.7234 |
| BRHC-M7 | -114.1138 | 46.8331 | 3417.0020 |
| MC-M8 | -113.9391 | 46.7652 | 3899.7287 |
| MC-M9 | -113.9342 | 46.7364 | 4055.4354 |
| BRNWC-V10 | -114.0799 | 46.6898 | 3186.3648 |
| BRNWC-M11 | -114.1286 | 46.6972 | 4527.9715 |
| BRNWC-M12 | -114.1136 | 46.6996 | 3854.7910 |
| BRNWC-F13P | -114.0942 | 46.6971 | 3502.2369 |
| BRNWC-F14 | -114.0370 | 46.6982 | 3339.3114 |
| EMC-V15 | -113.9715 | 46.6465 | 3730.8809 |
| EMC-M16P | -113.8781 | 46.6581 | 4539.9977 |
| EMC-M16 | -113.8780 | 46.6586 | 4542.6677 |
| EMC-M17 | -113.8350 | 46.6399 | 5913.8228 |
| EMC-M18 | -113.8690 | 46.6451 | 4506.6116 |
| TMC-F19 | -113.9877 | 46.5881 | 3663.9019 |
| TMC-M20 | -113.8514 | 46.6018 | 5066.0863 |
| TMC-M21P | -113.8942 | 46.6192 | 4428.3041 |
| TMC-M21P End | -113.8942 | 46.6192 | 4428.3041 |
| TMC-F22 | -113.9201 | 46.6184 | 4102.2546 |
| BRLC-F23 | -114.0209 | 46.5808 | 3447.7218 |
| AC-M24 | -113.8487 | 46.5246 | 6078.3009 |
| AC-M25P | -113.8862 | 46.5380 | 4651.6834 |
| AC-M25 | -113.8840 | 46.5369 | 4668.5246 |
| AC-M25P-End | -113.8840 | 46.5369 | 4668.5246 |
| TMC-F26 | -113.9928 | 46.5423 | 3533.8914 |
| BFBRS-V27 | -114.0248 | 46.5060 | 3637.7349 |
| BFBRS-V28 | -114.0561 | 46.4983 | 3514.9354 |
| LLC-M29 | -114.2219 | 46.7434 | 3774.8563 |
| LLC-M30 | -114.2501 | 46.7611 | 3698.7917 |
| BRSC-V31 | -114.1285 | 46.4723 | 3327.3829 |
| BFBRS-V32 | -114.1169 | 46.5077 | 3284.1207 |
| MC-M33 | -114.1779 | 46.4929 | 4746.5450 |
| MC-M34 | -114.1850 | 46.4929 | 5278.5190 |
| MC-M35 | -114.1758 | 46.4836 | 4083.0705 |
| BRSC-M36 | -114.1846 | 46.4737 | 4541.0797 |
| BRSC-F37 | -114.1666 | 46.4478 | 3494.6637 |
| BRSC-F38 | -114.1821 | 46.4540 | 3788.6309 |
| BC-M39 | -114.2326 | 46.4388 | 5404.0912 |

| SITE ID | X | Y | Z |
|---|---|---|---|
| BRSC-M40 | -114.2174 | 46.4450 | 5542.9482 |
| BC-M41 | -114.2189 | 46.4386 | 4976.6057 |
| BRBC-F42 | -114.1557 | 46.4111 | 3441.6011 |
| BRBC-F43 | -114.1543 | 46.3887 | 3483.1795 |
| LLC-M44 | -114.1674 | 46.7213 | 5448.2877 |
| LLC-M45 | -114.1495 | 46.7228 | 5124.8898 |
| LLC-M46 | -114.1544 | 46.7334 | 3993.9928 |
| LLC-M47 | -114.1481 | 46.7351 | 4110.7198 |
| ULC-M48P | -114.5319 | 46.7367 | 4178.0463 |
| ULC-M48 | -114.5363 | 46.7401 | 4272.0820 |
| HC-M49 | -114.5209 | 46.7790 | 4437.0226 |
| HC-M51P | -114.4964 | 46.7840 | 4228.9278 |
| HC-M52P | -114.4924 | 46.7842 | 4212.7284 |
| HC-M53P | -114.4885 | 46.7837 | 4177.9498 |
| HC-M54P | -114.4845 | 46.7829 | 4124.1316 |
| HC-M55P | -114.4923 | 46.7841 | 4208.2241 |
| ULC-M56 | -114.4157 | 46.7407 | 5492.8448 |
| ULC-M57 | -114.4238 | 46.7331 | 5620.6992 |
| WFBC-M58 | -114.3359 | 46.7269 | 4564.4600 |
| LCGC-M59 | -114.4133 | 46.7868 | 3990.1414 |
| LCGC-M61P | -114.4118 | 46.7836 | 3910.1916 |
| LCGC-M62P | -114.4112 | 46.7824 | 3879.6060 |
| LCGC-M63P | -114.4109 | 46.7818 | 3836.4692 |
| WFBC-M64 | -114.3156 | 46.7469 | 3845.0158 |
| SFLC-M65 | -114.3616 | 46.6825 | 5852.9301 |
| WFBC-M66 | -114.3331 | 46.7191 | 5168.8150 |
| SFLC-M67 | -114.3217 | 46.7268 | 4769.9462 |
| WFBC-M68 | -114.4194 | 46.7237 | 5814.1752 |
| WFBC-M70P | -114.3255 | 46.7377 | 4277.7651 |
| WFBC-M71P | -114.3241 | 46.7417 | 4158.4173 |
| WFBC-M72P | -114.3242 | 46.7461 | 4017.0020 |
| WFBC-M73 | -114.3130 | 46.7431 | 4100.6998 |
| SFLC-M74 | -114.2866 | 46.7449 | 3903.2270 |
| LCGC-M75 | -114.3271 | 46.7807 | 4203.8990 |
| LCGC-M76 | -114.3140 | 46.7796 | 3820.7736 |
| LCGC-M77 | -114.4130 | 46.8230 | 4201.7763 |
| NFHC-M78 | -114.4536 | 46.8195 | 5077.6352 |
| LCGC-M79 | -114.3869 | 46.8285 | 4515.6099 |
| LBFBR-M80 | -113.9041 | 46.4030 | 4780.6542 |
| LBFBR-M81P | -113.9044 | 46.4055 | 4760.0971 |
| LBFBR-M82P | -113.9053 | 46.4124 | 4736.2356 |
| LBFBR-M83P | -113.9080 | 46.4192 | 4650.5577 |
| LBFBR-M84 | -113.9200 | 46.4357 | 4515.1319 |
| LBFBR-M85 | -113.9212 | 46.4479 | 4413.8018 |
| LBFBR-M86 | -114.0256 | 46.4434 | 3743.7352 |
| BC-M87 | -114.2715 | 46.3973 | 5951.7556 |
| MC-F88 | -114.2009 | 46.3535 | 3859.3238 |

| SITE ID | X | Y | Z |
|---|---|---|---|
| MC-F89 | -114.2308 | 46.3466 | 4127.2936 |
| MC-F89A | -114.2308 | 46.3466 | 4127.2936 |
| BRBC-F90 | -114.1546 | 46.3709 | 3484.5827 |
| BRLiC-M91 | -114.2457 | 46.1415 | 5361.9026 |
| BRLiC-M92 | -114.2589 | 46.0854 | 4688.7339 |
| BRD-M93 | -114.2438 | 46.0416 | 4806.0007 |
| BRLiC-F94 | -114.2016 | 46.1059 | 3881.4964 |
| BRLiC-F95 | -114.2125 | 46.1936 | 4097.8491 |
| BRW-M96 | -114.2328 | 46.2601 | 4403.4163 |
| WC-M97 | -113.9409 | 46.3150 | 6102.1880 |
| WC-M98P | -113.9230 | 46.2952 | 5434.5030 |
| WC-M99P | -113.9321 | 46.2936 | 5172.6339 |
| WC-M100P | -113.9354 | 46.2929 | 5106.8402 |
| WC-M101P | -113.9449 | 46.2921 | 4903.0482 |
| BRBC-F102 | -114.0488 | 46.3126 | 3758.2080 |
| BRBC-F103 | -114.0084 | 46.3265 | 4445.5253 |
| BRBC-F103 Driveway | -114.0084 | 46.3265 | 4445.5253 |
| WC-F104 | -114.0182 | 46.2765 | 4204.0676 |
| BRW-F105 | -114.0813 | 46.2147 | 3905.5791 |
| LRC-M106 | -113.9948 | 46.0607 | 6448.8540 |
| LRC-M107P | -114.0175 | 46.0488 | 5527.0942 |
| LRC-M108P | -114.0152 | 46.0447 | 5441.3763 |
| LRC-M109P | -114.0118 | 46.0413 | 5280.3205 |
| LRC-M110P | -114.0105 | 46.0375 | 5230.6693 |
| MSCC-M111 | -113.9884 | 46.1267 | 5887.3871 |
| LSCC-M112 | -114.0082 | 46.1269 | 5244.2205 |
| BRCC-V113 | -114.1131 | 46.2023 | 3755.2802 |
| BRCC-V114 | -114.1130 | 46.2120 | 3718.2284 |
| LRC-M115 | -114.0169 | 46.0522 | 5613.8527 |
| URC-M116 | -113.9693 | 46.0003 | 6100.2366 |
| URC-M118P | -113.9649 | 45.9827 | 5042.4259 |
| URC-M119P | -113.9695 | 45.9779 | 4959.8901 |
| URC-M120P | -113.9759 | 45.9744 | 4880.8094 |
| URC-M121P | -113.9822 | 45.9709 | 4787.0535 |
| URC-M122P | -113.9873 | 45.9664 | 4697.0302 |
| URC-M123 | -113.9639 | 45.9571 | 5198.2556 |
| URC-M124 | -113.9991 | 45.9650 | 4629.6693 |
| URC-M125 | -114.0161 | 45.9702 | 4443.7576 |
| LRC-M126 | -114.0541 | 46.0006 | 5190.6339 |
| LRC-M127 | -114.0143 | 46.0309 | 5057.4154 |
| LRC-M128 | -114.0602 | 46.0343 | 6398.1880 |
| USCC-M129 | -113.9799 | 46.0643 | 6166.0660 |
| BRBC-F131P | -114.0170 | 46.3256 | 4289.7001 |
| BRBC-F132P | -114.0198 | 46.3269 | 4230.4003 |
| BRBC-F133P | -114.0240 | 46.3256 | 4166.0653 |
| BRBC-F134P | -114.0281 | 46.3255 | 4098.6142 |
| BRBC-F135P | -114.0324 | 46.3256 | 4068.5404 |

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| BRCC-F136 | -114.1583 | 45.9429 | 4239.5345 |
| BRCC-V137 | -114.1415 | 45.9420 | 4014.9301 |
| BRCC-M138 | -114.1620 | 45.9284 | 4571.3133 |
| BRCC-M139 | -114.2226 | 45.9606 | 5057.3081 |
| BRD-M140 | -114.2308 | 45.9629 | 5444.9098 |
| BRCC-M141 | -114.2279 | 45.9586 | 5322.0249 |
| LRC-V142 | -114.1271 | 45.9649 | 3998.6467 |
| LRC-F143 | -114.1027 | 45.9675 | 4047.6581 |
| BRD-V144 | -114.1506 | 45.9892 | 3938.9367 |
| BRD-F145 | -114.2132 | 46.0347 | 4087.5758 |
| LRC-M146 | -114.0203 | 46.0544 | 5690.5860 |
| BRD-M147 | -114.0770 | 46.0484 | 5826.2740 |
| LSCC-M148 | -114.0450 | 46.0997 | 5728.5965 |
| MSC-M149 | -113.9858 | 46.1815 | 5474.0404 |
| MSC-M150 | -113.9883 | 46.1763 | 5329.6555 |
| DC-M151 | -113.8449 | 46.1767 | 6178.3927 |
| USC-M152 | -113.8616 | 46.1700 | 5989.5066 |
| DC-M153P | -113.8645 | 46.2013 | 5256.2579 |
| DC-M154P | -113.8673 | 46.1990 | 5219.5226 |
| DC-M155P | -113.8689 | 46.1961 | 5152.9528 |
| DC-M156P | -113.8760 | 46.1933 | 5041.1211 |
| DC-M157P | -113.8798 | 46.1924 | 5020.1148 |
| USC-M158 | -113.8968 | 46.1236 | 6369.8396 |
| DC-M159 | -113.8384 | 46.0585 | 6973.4141 |
| BRD-F160 | -114.0871 | 46.2763 | 3676.2408 |
| BRLC-F161P | -114.1924 | 46.1669 | 3759.9974 |
| BRLC-F162 | -114.1955 | 46.1653 | 3772.5902 |
| LLHC-M163P | -114.2712 | 46.1043 | 4257.1637 |
| ULHC-M164P | -114.2810 | 46.1062 | 4282.2185 |
| ULHC-M165P | -114.2840 | 46.1128 | 4368.3494 |
| ULHC-M166P | -114.2939 | 46.1152 | 4359.2339 |
| ULHC-M167P | -114.3013 | 46.1194 | 4393.2389 |
| BRW-F168 | -114.2186 | 46.2601 | 4047.4200 |
| WC-F169 | -113.9920 | 46.2961 | 4269.7211 |
| WC-M170 | -113.9350 | 46.3035 | 5816.8635 |
| WC-M171 | -113.9316 | 46.2725 | 5813.0919 |
| LLC-M172 | -114.1704 | 46.7684 | 4638.7936 |
| LLC-M173 | -114.1748 | 46.7620 | 4793.0955 |
| BRNWC-M174 | -114.0009 | 46.7381 | 3745.9455 |
| BRNWC-F176P | -114.0242 | 46.7339 | 3511.8891 |
| BRNWC-F177P | -114.0268 | 46.7336 | 3476.0830 |
| BRNWC-F178P | -114.0284 | 46.7332 | 3461.2953 |
| BRNWC-F179P | -114.0306 | 46.7327 | 3428.4662 |
| BRNWC-F180P | -114.0322 | 46.7323 | 3408.9938 |
| TCC-M181 | -114.2170 | 45.9826 | 4518.1234 |
| BRD-M182 | -114.1988 | 45.9672 | 4555.8310 |
| BRD-F183P | -114.1590 | 45.9691 | 4194.0427 |

| SITE ID | X | Y | Z |
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| BRD-F184P | -114.1553 | 45.9713 | 4119.3461 |
| BRD-F185P | -114.1501 | 45.9743 | 3991.6844 |
| BRLiC-F186 | -114.1587 | 46.1301 | 3840.1722 |
| BRLiC-F187 | -114.2069 | 46.1297 | 3952.5118 |
| BRW-F188 | -114.0389 | 46.2762 | 3992.7822 |
| McC-F189 | -114.1407 | 46.4920 | 3403.4938 |
| McC-F190 | -114.1272 | 46.5133 | 3333.3333 |
| LLC-M191 | -114.2305 | 46.7370 | 4080.8661 |
| BC-F192 | -114.1092 | 46.5760 | 3378.1959 |
| BRLC-F193 | -114.1098 | 46.6013 | 3390.3396 |
| SC-F194 | -114.0884 | 46.6086 | 3264.4357 |
| BRLC-V195 | -114.0721 | 46.6112 | 3218.5039 |