

**Condition of Streams in the South Fork Shenandoah River Drainage, 2004,
Dry River Ranger District, George Washington-Jefferson National Forest, VA**



United States Department of Agriculture Forest Service
Southern Research Station
Center for Aquatic Technology Transfer

1650 Ramble Rd.
Blacksburg, VA 24060-6349



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Introduction

Throughout summer 2004 we conducted stream habitat inventories on South Fork Shenandoah River drainage streams within the Dry River Ranger District, George Washington-Jefferson National Forest (GWJNF), Virginia, to quantify stream habitat conditions. Habitat conditions in 17 streams (56 km) were classified and inventoried between May and November 2004 using basinwide visual estimation technique (BVET) habitat inventories (Dolloff et. al 1993). These inventories completed the third and final year of BVET habitat inventories in the Shenandoah River drainage of the Dry River Ranger District. Results of previous BVET habitat inventories in the Shenandoah River drainage of the Dry River District can be found in Duty et al. (2002) and Fitzpatrick et al. (2003).

We modified standard BVET methods to measure stream habitat parameters identified in the George Washington Forest plan. Included in the Forest plan is an outline of the desired-future-condition (DFC) for all the streams within the Forest¹. The pertinent DFCs for the Forest include: woody debris loading - 78 to 186 pieces per kilometer, and percent pool habitat - 35 to 65 percent of the total stream habitat. We mistakenly reported the DFC for pool habitat as 30 to 70 percent of total stream habitat in reports prior to 2003.

The purpose of this report is to describe the current condition of Dry River Ranger District streams in a format useful to the Dry River Ranger District and the GWJNF. The enclosed report is intended to provide baseline information for Forest planning, habitat improvement projects, and land use decisions.

Methods

Surveys began at confluences for streams contained within National Forest boundaries and at the downstream USFS boundary for all other streams. Surveys were terminated when we encountered an upstream USFS boundary, or when the wetted channel was < 1 m average wetted width or dry for > 500 m.

Two-stage visual estimation techniques were used to quantify habitat and DFCs in selected Dry River Ranger District streams. During the first stage, habitat was stratified into similar groups based on naturally occurring habitat units including pools (areas in the stream with concave bottom profile, gradient equal to zero, greater than average depth, and smooth water surface), and riffles (areas in the stream with convex bottom profile, greater than average gradient, less than average depth, and turbulent water surface). Glides (areas in the stream similar to pools, but with average depth and flat bottom profile) were identified during the survey but were grouped with pools for data analysis. Runs (areas in the stream similar to riffles but with average depth, less turbulent flow, and flat bottom profile) and cascades (areas in the stream with > 12% gradient, high velocity, and exposed bedrock or boulders) were grouped with riffles for data analysis.

¹the GeorgeWashington portion of the GWJNF has a separate Forest plan and different DFCs from the Jefferson portion of the GWJNF

Habitat in each stream was classified and inventoried by a two-person crew. One crew member identified each habitat unit by type (as described above), estimated average wetted width, average and maximum depth, riffle crest depth (RCD), substrate composition, and percent fines. The length (0.1 m) of each habitat unit was measured with a hip chain. Average wetted width was visually estimated. Average and maximum depth of each habitat unit were estimated by taking depth measurements at various places across the channel profile with a graduated staff marked in 5 cm increments. The RCD was estimated by measuring water depth at the deepest point in the hydraulic control between riffles and pools. The RCD was subtracted from average pool depth to obtain an estimate of residual pool depth. Substrates were assigned to one of nine size classes (Appendix A). Dominant substrate (covered greatest amount of surface area in habitat unit) and subdominant substrate (covered 2nd greatest amount of surface area in habitat unit) were visually estimated. Percent fines was the percent of surface area of the stream bed that consisted of sand, silt, or clay substrate particles (particles < 2 mm diameter). In addition, several attributes of road-stream crossings (location, type, size, etc.) were recorded, where encountered.

The second crew member classified and inventoried large woody debris (LWD) within the stream channel, determined the Rosgen's channel type (Appendix A) associated with each habitat unit, and recorded data on a Husky fex21 data logger. LWD was assigned to one of four size classes (Appendix A). All woody debris less than 1.0 m long and less than 10 cm in diameter were omitted from the survey. Rosgen's channel type was visually estimated using criteria found in Rosgen (1996).

The first unit of each habitat type selected for intensive (second stage) sampling (i.e. accurate measurement of wetted width) was determined randomly. Additional units were selected systematically (every 10th habitat unit type for streams >1000 m and every 5th habitat unit type for streams <500 m). The wetted width of each systematically selected habitat unit was measured with a meter tape across at least three transects and averaged. In each of the systematically selected (second stage) riffles we also estimated the bankfull stream channel width and riparian width, measured channel gradient and water temperature, and took a digital photograph. We estimated bankfull channel width by measuring the width of the bankfull channel perpendicular to flow. We estimated riparian width by measuring from the edge of the bankfull channel to the intersection with the nearest landform at an elevation equal to two-times maximum bankfull depth as described by Rosgen (1996). Gradient was estimated by using a clinometer to site from the downstream to the upstream end of the selected riffle. Water temperature was measured with a thermometer in flowing water out of direct sunlight.

We used the ratio of measured to estimated area to develop a calibration ratio, which allowed us to correct visual estimates and estimate stream area with confidence intervals (Hankin and Reeves 1988). BVET calculations were computed with a Microsoft Excel spreadsheet using formulas found in Dolloff et al. (1993). Data were summarized using Excel spreadsheets and SigmaPlot graphics software.

Literature Cited

- Dolloff, C. A., D. G. Hankin, and G. H. Reeves. 1993. Basinwide estimation of habitat and fish populations in streams. General Technical Report SE-83. Asheville, North Carolina: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experimental Station.
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User's Guide

Stream summaries are organized in alphabetical order by U. S. Geological Survey (USGS) 1:24,000 Topographic Quadrangle, and then by stream name. The upper right hand corner of each page in the 'Stream Summaries' section contains the USGS quadrangle name for the selected stream.

Data for each stream section were collected, analyzed, and presented separately. Each stream or stream section summary contains:

1. several tables summarizing stream characteristics;
2. figures showing frequency of substrate types, area in pools and riffles, average, maximum, and residual depths, and LWD per kilometer;
3. table describing features encountered on the stream;
4. table describing road-stream crossings;
5. figures showing the distribution of LWD, substrate types, and Rosgen's channel types;
6. table documenting photographs taken during inventories.

George Washington Forest DFCs are indicated on all pertinent tables and graphs.

We also included several summary tables (see 'Summary Tables' section) that summarize all data collected. The tables allow managers to quickly compare between Dry River Ranger District streams inventoried in summer 2004. Digital photographs taken during the stream inventories were copied to CDs and provided to the GWJNF.

Summary Tables

Survey information and summary of general stream habitat characteristics for streams surveyed using the BVET habitat survey on the Dry River District during summer 2004. NA = data was not recorded. No access = stream was not surveyed due to lack of access. 'Length' is total survey length, 'Width' is mean bankfull channel width, 'Gradient' is mean channel gradient, and 'Temperature' is mean water temperature.

| Stream | Quad | Date | Length (km) | Width (m) | Gradient (%) | Temperature (C) |
|-------------------------|----------------|-------------|------------------------|----------------------|-------------------------|----------------------------|
| Laurel Run | Brandywine | 06/29/04 | 4.5 | 6 | 10 | 13 |
| Low Place Run | Brandywine | 11/05/04 | 3.9 | 8 | 9 | 9.5 |
| Union Springs Run | Briery Branch | 08/02/04 | 2.3 | 5 | 4 | 18 |
| Trout Run | Palo Alto | 06/29/04 | 2.4 | 7 | 4 | 14.5 |
| Little Laurel Run | Rawley Springs | 06/29/04 | 0.5 | NA | NA | NA |
| Big Run | Reddish Knob | 06/30/04 | 5.6 | 6 | 4 | 12 |
| North Fork Little River | Reddish Knob | 06/21/04 | 7.2 | 5 | 6 | 11 |
| South Fork Little River | Reddish Knob | 06/22/04 | 2.7 | 21 | 3 | 11.5 |
| Wolf Run | Reddish Knob | 06/30/04 | 3.0 | 5 | 3 | 14 |
| Buckhorn Creek | Stokesville | 06/23/04 | 3.3 | 6 | 4 | 18 |
| Little River | Stokesville | 06/17/04 | 0.9 | 17 | 2 | 17 |
| Skidmore Fork | Stokesville | 06/15/04 | 4.1 | 10 | 2 | 19 |
| Stony Run | Stokesville | 06/23/04 | 3.6 | 6 | 9 | 14 |
| Tunnel Hollow | Stokesville | 06/28/04 | 1.7 | 6 | 3 | 16 |
| White Oak Run | Stokesville | 06/22/04 | 4.2 | 7 | 2 | 19 |
| Horse Trough Hollow | West Augusta | 06/15/04 | 1.8 | 6 | 6 | 14 |
| Mitchell Branch | West Augusta | 06/16/04 | 1.1 | 5 | 4 | 14 |
| Stillhouse Hollow | West Augusta | 06/16/04 | 3.0 | 5 | 5 | 17 |

Summary of pool habitat characteristics for streams surveyed using the BVET habitat survey on the Dry River District during summer 2004. The George Washington National Forest DFC is between 35% and 65% of total stream area in pools. NA = could not be calculated. 'Total Area (%)' is percent of total stream surface area in pools (includes glides), 'Total Area (m²)' is surface area of stream in pools, 'Mean Area' is mean surface area of individual pools, 'Mean Max Depth' is the mean maximum depth of all pools, 'Mean Ave Depth' is mean average depth of all pools, 'Mean Resid Depth' is mean residual depth of all pools, 'Glides' is percent of pool habitat units surveyed as glides, '>35% Fines' is percent of pools with greater than 35% of substrate materials < 2 mm in diameter.

| Stream | Total Area (%) | Total Area (m²) | Total Count (n) | # per km | Mean Area (m²) | Mean Max Depth (cm) | Mean Ave Depth (cm) | Mean Resid Depth (cm) | Glides (%) | >35% Fines (%) |
|-------------------------|-----------------------|-----------------------------------|------------------------|-----------------|----------------------------------|----------------------------|----------------------------|------------------------------|-------------------|--------------------------|
| Laurel Run | 58 | 10808 | 247 | 55 | 44 | 39 | 22 | 12 | 19 | 16 |
| Low Place Run | 10 | 1663 | 56 | 14 | 30 | 75 | 52 | 34 | 0 | 2 |
| Union Springs Run | 51 | 3082 | 55 | 23 | 56 | 38 | 19 | 12 | 2 | 4 |
| Trout Run | 21 | 1058 | 70 | 29 | 15 | 34 | 21 | 14 | 6 | 20 |
| Little Laurel Run | NA | NA | 4 | 8 | NA | 34 | 20 | 11 | 0 | 0 |
| Big Run | 28 | 2067 | 68 | 12 | 30 | 40 | 26 | 18 | 12 | 7 |
| North Fork Little River | 31 | 2638 | 140 | 19 | 19 | 28 | 16 | 9 | 26 | 9 |
| South Fork Little River | 31 | 907 | 20 | 7 | 45 | 28 | 18 | 11 | 10 | 60 |
| Wolf Run | 11 | 821 | 67 | 22 | 12 | 38 | 21 | 14 | 24 | 28 |
| Buckhorn Creek | 39 | 3735 | 132 | 40 | 28 | 32 | 18 | 9 | 18 | 28 |
| Little River | 20 | 1456 | 10 | 11 | 146 | 84 | 58 | 16 | 10 | 0 |
| Skidmore Fork | 18 | 3554 | 64 | 16 | 55 | 51 | 32 | 14 | 11 | 0 |
| Stony Run | 18 | 1436 | 81 | 22 | 18 | 42 | 28 | 20 | 0 | 25 |
| Tunnel Hollow | 24 | 749 | 40 | 23 | 19 | 34 | 18 | 13 | 20 | 40 |
| White Oak Run | 61 | 10927 | 128 | 30 | 85 | 49 | 33 | 23 | 5 | 52 |
| Horse Trough Hollow | 65 | 1625 | 110 | 62 | 15 | 27 | 16 | 9 | 25 | 5 |
| Mitchell Branch | 13 | 374 | 28 | 25 | 13 | 37 | 23 | 13 | 0 | 4 |
| Stillhouse Hollow | 23 | 1422 | 180 | 60 | 8 | 25 | 15 | 8 | 23 | 27 |

Summary of riffle habitat characteristics for streams surveyed using the BVET habitat survey on the Dry River District during summer 2004. NA = could not be calculated. ‘Total Area (%)’ is percent of total stream surface area in riffles (includes runs and cascades), ‘Total Area (m²)’ is surface area of stream in riffles, ‘Mean Area’ is mean surface area of individual riffles, ‘Mean Max Depth’ is the mean maximum depth of all riffles, ‘Mean Ave Depth’ is mean average depth of all riffles, ‘Runs’ is percent of riffle habitat units surveyed as runs, ‘Cascades’ is percent of riffle habitat units surveyed as cascades.

| Stream | Total Area (%) | Total Area (m²) | Total Count (n) | # per km | Mean Area (m²) | Mean Max Depth (cm) | Mean Ave Depth (cm) | Runs (%) | Cascades (%) |
|-------------------------|-----------------------|-----------------------------------|------------------------|-----------------|----------------------------------|----------------------------|----------------------------|-----------------|---------------------|
| Laurel Run | 42 | 7715 | 216 | 48 | 36 | 22 | 12 | 38 | 12 |
| Low Place Run | 90 | 15276 | 60 | 15 | 255 | 38 | 19 | 0 | 7 |
| Union Springs Run | 49 | 2912 | 49 | 21 | 59 | 17 | 9 | 2 | 2 |
| Trout Run | 79 | 3886 | 66 | 28 | 59 | 20 | 9 | 2 | 2 |
| Little Laurel Run | NA | NA | 6 | 11 | NA | 13 | 7 | 0 | 0 |
| Big Run | 72 | 5411 | 73 | 13 | 74 | 16 | 8 | 3 | 1 |
| North Fork Little River | 69 | 5940 | 129 | 18 | 46 | 15 | 7 | 1 | 16 |
| South Fork Little River | 69 | 2067 | 18 | 7 | 115 | 11 | 5 | 6 | 0 |
| Wolf Run | 89 | 6504 | 68 | 22 | 96 | 25 | 12 | 1 | 0 |
| Buckhorn Creek | 61 | 5792 | 118 | 36 | 49 | 17 | 9 | 0 | 0 |
| Little River | 80 | 5720 | 19 | 21 | 301 | 33 | 22 | 32 | 0 |
| Skidmore Fork | 82 | 16488 | 67 | 17 | 246 | 28 | 14 | 24 | 0 |
| Stony Run | 82 | 6452 | 90 | 25 | 72 | 18 | 8 | 0 | 2 |
| Tunnel Hollow | 76 | 2353 | 42 | 24 | 56 | 19 | 9 | 0 | 0 |
| White Oak Run | 39 | 6992 | 106 | 25 | 66 | 17 | 10 | 0 | 0 |
| Horse Trough Hollow | 35 | 884 | 35 | 20 | 25 | 14 | 7 | 17 | 3 |
| Mitchell Branch | 87 | 2588 | 29 | 26 | 89 | 14 | 6 | 3 | 0 |
| Stillhouse Hollow | 77 | 4723 | 163 | 54 | 29 | 14 | 7 | 2 | 6 |

Summary of LWD per km and Rosgen's channel types for streams surveyed using the BVET habitat survey on the Dry River District during summer 2004. The GWJNF DFC for total LWD is 78 to 186 pieces per km. LWD sizes: 1) <5 m long, <55 cm diameter, 2) < 5 m long, >55 cm diameter, 3) >5 m long, <55 cm diameter, 4) >5 m long, >55 cm diameter. See Appendix A for description of Rosgen channel types.

| Stream | Large Woody Debris per km | | | | | Rosgen's Channel Type | | | | | | |
|-------------------------|---------------------------|---|-----|----|-------|-----------------------|-----|-----|---|---|-----|---|
| | 1 | 2 | 3 | 4 | Total | A | B | C | D | E | F | G |
| Laurel Run | 47 | 7 | 38 | 17 | 109 | 49 | 44 | 6 | 0 | 0 | 0 | 0 |
| Low Place Run | 39 | 4 | 31 | 13 | 88 | 44 | 56 | 0 | 0 | 0 | 0 | 0 |
| Union Springs Run | 24 | 0 | 30 | 7 | 61 | 0 | 62 | 38 | 0 | 0 | 0 | 0 |
| Trout Run | 36 | 1 | 23 | 5 | 65 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Little Laurel Run | 98 | 0 | 141 | 85 | 324 | 0 | 0 | 100 | 0 | 0 | 0 | 0 |
| Big Run | 30 | 0 | 33 | 2 | 65 | 10 | 14 | 74 | 0 | 0 | 1 | 0 |
| North Fork Little River | 29 | 1 | 14 | 3 | 47 | 73 | 0 | 27 | 0 | 0 | 0 | 0 |
| South Fork Little River | 13 | 0 | 12 | 0 | 25 | 0 | 78 | 22 | 0 | 0 | 0 | 0 |
| Wolf Run | 15 | 0 | 24 | 11 | 51 | 0 | 100 | 0 | 0 | 0 | 0 | 0 |
| Buckhorn Creek | 43 | 1 | 30 | 5 | 79 | 0 | 8 | 0 | 0 | 0 | 92 | 0 |
| Little River | 4 | 0 | 4 | 0 | 9 | 0 | 100 | 0 | 0 | 0 | 0 | 0 |
| Skidmore Fork | 30 | 0 | 10 | 2 | 42 | 0 | 100 | 0 | 0 | 0 | 0 | 0 |
| Stony Run | 22 | 0 | 17 | 3 | 42 | 76 | 24 | 0 | 0 | 0 | 0 | 0 |
| Tunnel Hollow | 11 | 0 | 7 | 3 | 21 | 0 | 100 | 0 | 0 | 0 | 0 | 0 |
| White Oak Run | 4 | 0 | 41 | 14 | 59 | 0 | 0 | 0 | 0 | 0 | 100 | 0 |
| Horse Trough Hollow | 43 | 1 | 23 | 6 | 73 | 100 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mitchell Branch | 39 | 0 | 8 | 3 | 50 | 0 | 0 | 0 | 0 | 0 | 100 | 0 |
| Stillhouse Hollow | 18 | 1 | 33 | 4 | 56 | 43 | 0 | 54 | 0 | 0 | 0 | 3 |

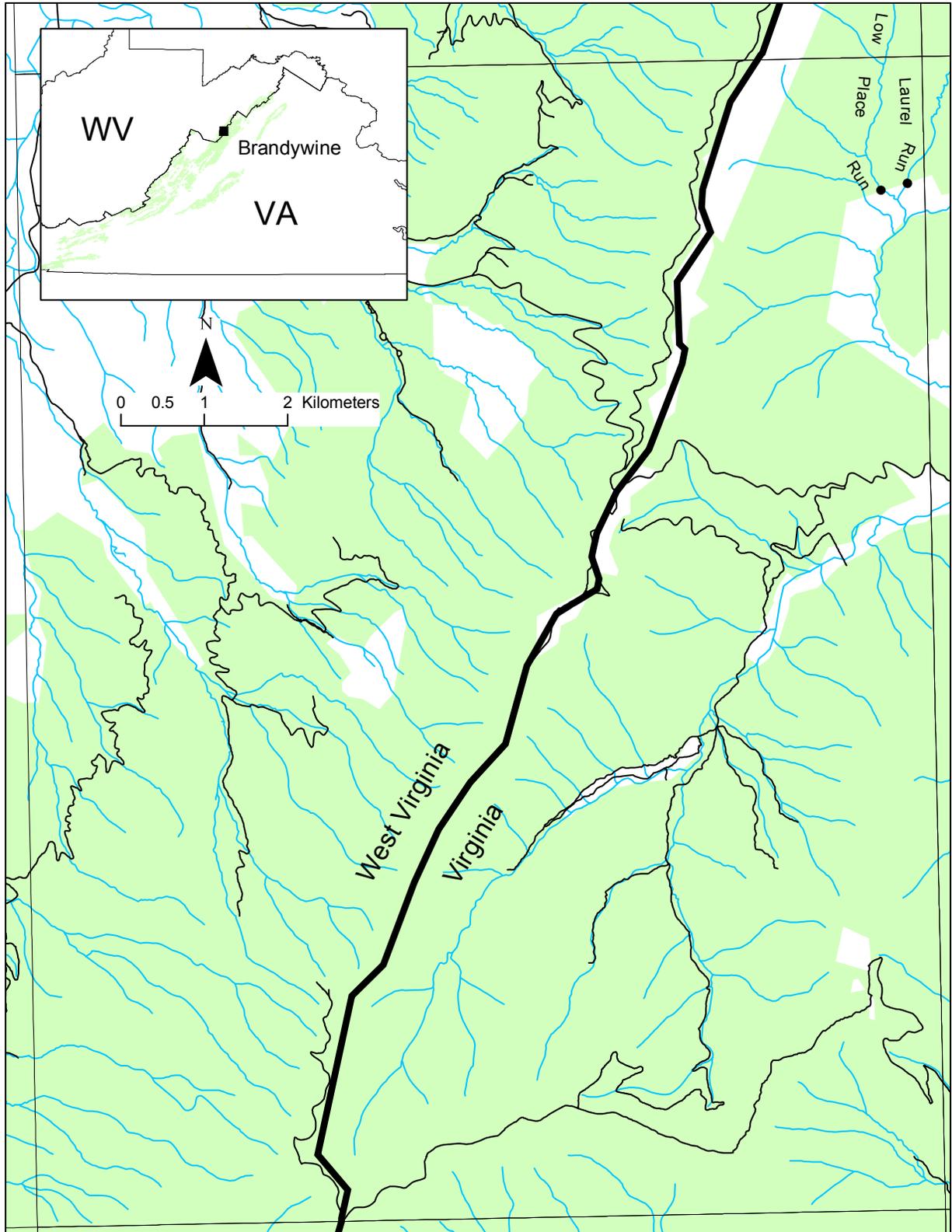
Summary of riparian width calculations for streams surveyed using the BVET habitat survey on the Dry River District during summer 2004. NA = data not recorded. The left riparian width, right riparian width, and bankfull channel widths were added together before values for 'Riparian Width Total' were calculated. Left and right riparian widths were pooled together before values for 'Riparian Left & Right Width' were calculated.

| Stream | Riparian Width Total (m) | | | | | Riparian Left & Right Width (m) | | | | |
|-------------------------|--------------------------|-----|------------------|------------------|-----|---------------------------------|-----|------------------|------------------|-----|
| | Mean | Max | 75 th | 25 th | Min | Mean | Max | 75 th | 25 th | Min |
| Laurel Run | 10 | 16 | 12 | 8 | 6 | 2 | 8 | 2 | 1 | 0 |
| Low Place Run | 26 | 46 | 33 | 17 | 11 | 9 | 25 | 13 | 4 | 1 |
| Union Springs Run | 9 | 14 | 13 | 4 | 4 | 2 | 6 | 3 | 1 | 0 |
| Trout Run | 9 | 15 | 11 | 8 | 6 | 1 | 6 | 1 | 1 | 0 |
| Little Laurel Run | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Big Run | 35 | 124 | 41 | 8 | 4 | 14 | 80 | 22 | 0 | 0 |
| North Fork Little River | 11 | 27 | 10 | 6 | 5 | 3 | 20 | 2 | 1 | 0 |
| South Fork Little River | 57 | 93 | 75 | 39 | 21 | 18 | 33 | 29 | 8 | 2 |
| Wolf Run | 7 | 10 | 9 | 5 | 5 | 1 | 3 | 1 | 1 | 0 |
| Buckhorn Creek | 9 | 26 | 9 | 6 | 3 | 1 | 18 | 1 | 0 | 0 |
| Little River | 34 | 40 | 37 | 31 | 28 | 8 | 26 | 9 | 2 | 2 |
| Skidmore Fork | 18 | 34 | 19 | 13 | 10 | 4 | 21 | 4 | 1 | 1 |
| Stony Run | 10 | 17 | 12 | 8 | 5 | 2 | 5 | 2 | 1 | 1 |
| Tunnel Hollow | 9 | 13 | 11 | 9 | 4 | 2 | 7 | 1 | 1 | 1 |
| White Oak Run | 12 | 86 | 12 | 7 | 3 | 3 | 50 | 1 | 0 | 0 |
| Horse Trough Hollow | 12 | 19 | 13 | 10 | 9 | 3 | 10 | 4 | 1 | 1 |
| Mitchell Branch | 17 | 22 | 20 | 14 | 12 | 6 | 12 | 9 | 2 | 1 |
| Stillhouse Hollow | 13 | 70 | 13 | 6 | 4 | 4 | 60 | 3 | 1 | 0 |

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Stream Summaries



Streams inventoried on the Brandywine Quadrangle using BVET habitat surveys during summer 2004.

| | |
|-------------------------------|--------------------------|
| Stream: | Laurel Run |
| District: | Dry River |
| USGS Quadrangle: | Brandywine |
| Survey Date: | 06/29/04 |
| Downstream Starting Point: | National Forest Boundary |
| Total Distance Surveyed (km): | 4.5 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 58 | 42 |
| Total Area (m ²): | 10808±356 | 7715±948 |
| Correction Factor Applied: | 1.13 | 1.23 |
| Number of Paired Samples: | 26 | 21 |
| Total Count: | 247 | 216 |
| Number per km: | 55 | 48 |
| Mean Area (m ²): | 44 | 36 |
| Mean Maximum Depth (cm): | 39 | 22 |
| Mean Average Depth (cm): | 22 | 12 |
| Mean Residual Depth (cm): | 12 | -- |
| Percent Surveyed as Glides: | 19 | -- |
| Percent Surveyed as Runs: | -- | 38 |
| Percent Surveyed as Cascades: | -- | 12 |
| Percent with >35% Fines: | 16 | 2 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 47 |
| < 5 m long, > 55 cm diameter: | 7 |
| > 5 m long, 10 cm – 55 cm diameter: | 38 |
| > 5 m long, > 55 cm diameter: | 17 |
| Total: | 109 |

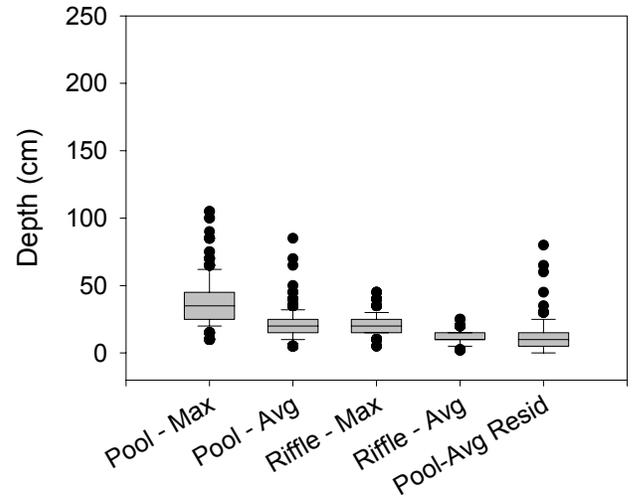
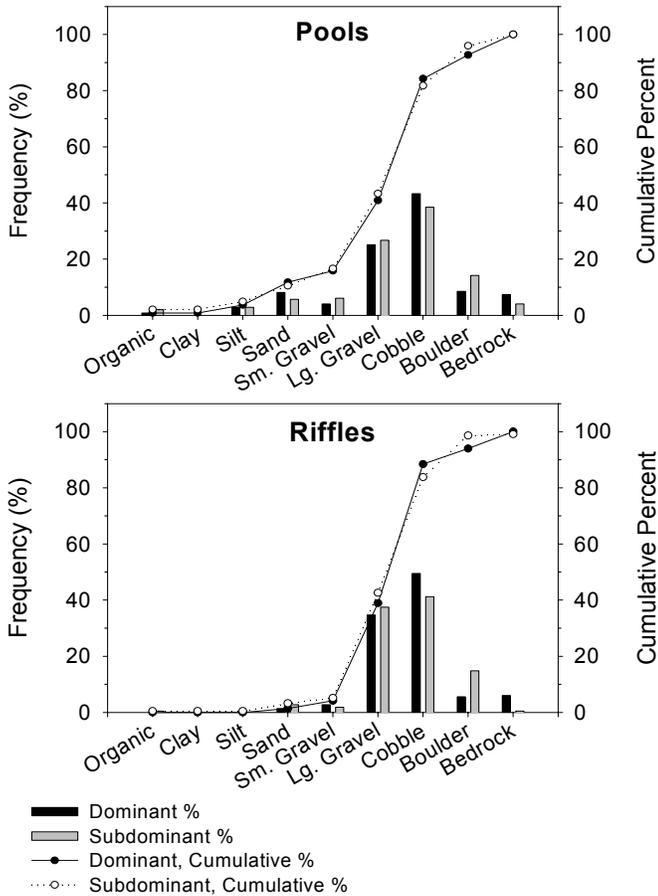
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 10 | 2 |
| Maximum | 16 | 8 |
| 75 th Percentile | 12 | 2 |
| 25 th Percentile | 8 | 1 |
| Minimum | 6 | 0 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

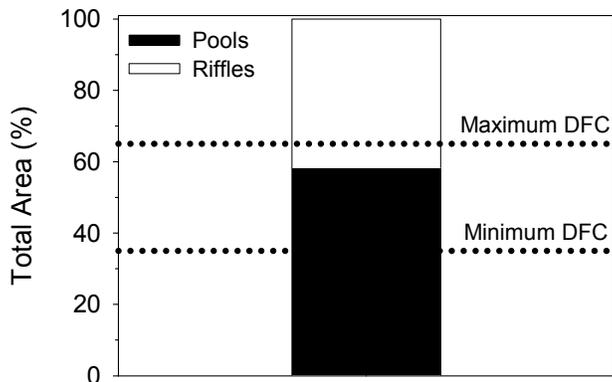
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 49 |
| B: | 44 |
| C: | 6 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 6 |
| Mean Channel Gradient (%): | 10 |
| Median Water Temperature (C): | 13 |

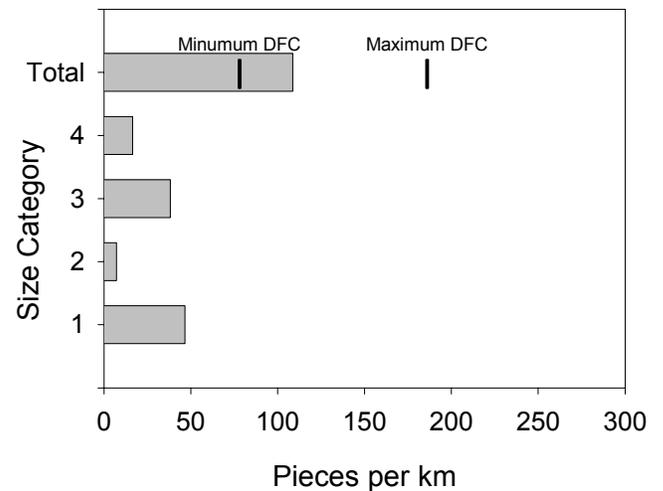


Maximum and average depths and residual pool depths for pools and riffles in Laurel Run, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Laurel Run, summer 2004.



Estimated area of Laurel Run in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Laurel Run, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Laurel Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|----------------|--------------|-----------|-------------------------------------|
| SIDE CHANNEL | 199.5 | | IN ON LEFT |
| SIDE CHANNEL | 245.5 | | OUT ON LEFT |
| SIDE CHANNEL | 283.2 | | IN ON RIGHT |
| TRIBUTARY | 431.8 | | IN ON LEFT |
| SIDE CHANNEL | 493.8 | | IN ON RIGHT |
| SIDE CHANNEL | 502.9 | | OUT ON RIGHT |
| SIDE CHANNEL | 537.8 | | IN ON RIGHT |
| UNDERGROUND | 606.5 | | FROM 566 m TO 606.5 m |
| SIDE CHANNEL | 635 | | IN ON LEFT ,DRY |
| SIDE CHANNEL | 681.8 | | IN ON LEFT, DRY |
| UNDERGROUND | 800 | | FROM 711 m TO 800 m; 4 DRY CHANNELS |
| LAND SLIDE | 993.3 | | LEFT |
| LAND SLIDE | 1022.6 | | END LEFT BANK SLIDE |
| SIDE CHANNEL | 1037.3 | | IN ON RIGHT |
| SIDE CHANNEL | 1078.1 | | OUT ON RIGHT |
| SIDE CHANNEL | 1407.2 | | IN ON RIGHT |
| SIDE CHANNEL | 1615.4 | | OUT ON LEFT |
| SIDE CHANNEL | 1720 | | IN ON LEFT |
| SIDE CHANNEL | 1740 | | OUT ON LEFT |
| TRIBUTARY | 1801.3 | | IN ON LEFT |
| TRIBUTARY | 1952.1 | | IN ON RIGHT |
| SEEP | 2055 | | LEFT |
| TRIBUTARY | 2066 | | IN ON LEFT |
| SIDE CHANNEL | 2088.5 | | IN ON RIGHT |
| SIDE CHANNEL | 2106 | | OUT ON LEFT |
| SIDE CHANNEL | 2232.1 | | IN ON LEFT |
| SIDE CHANNEL | 2239.5 | | OUT ON LEFT |
| LAND SLIDE | 2265.6 | | RIGHT |
| SIDE CHANNEL | 2326.8 | | IN ON LEFT |
| SIDE CHANNEL | 2336.5 | | OUT LEFT |
| FALL | 2409 | | 1.5M |
| TRIBUTARY | 2708 | | IN ON LEFT |
| BRAID | 2745.4 | | |
| FALL | 2996.2 | | 1.5M |
| SIDE CHANNEL | 3020.3 | | IN ON RIGHT |
| SIDE CHANNEL | 3042 | | OUT ON RIGHT |
| BRAID | 3172.9 | | |
| FALL | 3293.3 | | 1M |
| FALL | 3320.9 | | 1M |
| LOG DAM | 3325.4 | | 1M FILLED IN WITH ROCK UPSTREAM |
| FALL | 3562.3 | | 1.25M |
| SIDE CHANNEL | 3657 | | IN ON LEFT |
| SIDE CHANNEL | 3669.9 | | OUT ON LEFT |
| LAND SLIDE | 3681 | | LEFT |
| UNDERGROUND | 3890.7 | | FROM 3887.8 m TO 3890.7 m |
| FALL | 3896.8 | | 4M |
| UNDERGROUND | 4045.3 | | FROM 3992.7 m TO 4045.3 m |
| SEEP | 4064.2 | | RIGHT |

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|---------------------------|
| UNDERGROUND | 4064.2 | | FROM 4048.9 m TO 4064.2 m |
| UNDERGROUND | 4069 | | FROM 4065.1 m TO 4069 m |
| UNDERGROUND | 4087.5 | | FROM 4072.9 m TO 4087.5 m |
| UNDERGROUND | 4096.8 | | FROM 4092.3 m TO 4096.8 m |
| UNDERGROUND | 4115.2 | | FROM 4110.3 m TO 4115.2 m |
| UNDERGROUND | 4131 | | FROM 4122.8 m TO 4131 m |
| UNDERGROUND | 4172.5 | | FROM 4140 m TO 4172.5 m |
| UNDERGROUND | 4325.7 | | FROM 4305.8 m TO 4325.7 m |
| UNDERGROUND | 4366.5 | | FROM 4330.9 m TO 4366.5 m |
| UNDERGROUND | 4405.7 | | FROM 4369 m TO 4405.7 m |
| UNDERGROUND | 4421.3 | | FROM 4410 m TO 4421.3 m |
| UNDERGROUND | 4450.3 | | FROM 4431.9 m TO 4450.3 m |
| UNDERGROUND | 4465.8 | | FROM 4455 m TO 4465.8 m |
| UNDERGROUND | 4491 | | FROM 4472.5 m TO 4491 m |
| UNDERGROUND | 4503.2 | | FROM 4492.4 m TO 4503.2 m |

Stream crossings encountered on Laurel Run during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

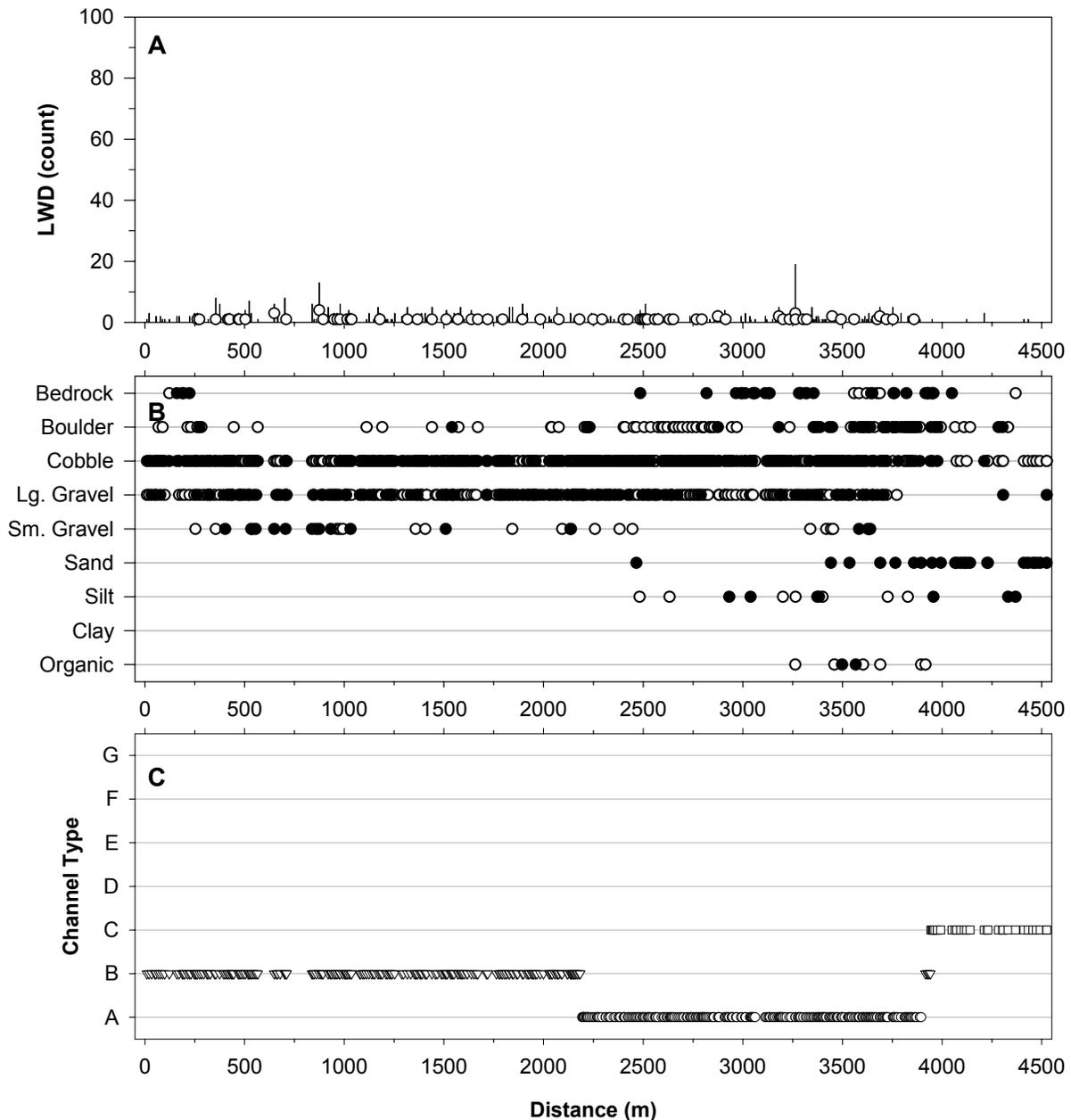
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

Comments:



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Laurel Run, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from National Forest boundary. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Laurel Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-----------------|
| RIFFLE | 7 | 171.4 | |
| RUN | 17 | 402.9 | |
| RIFFLE | 27 | 555.4 | |
| RIFFLE | 37 | 919.4 | |
| RUN | 47 | 1036.8 | |
| CASCADE | 57 | 1191.2 | |
| RUN | 67 | 1364.7 | |
| RIFFLE | 77 | 1516.5 | |
| RIFFLE | 87 | 1662 | |
| RIFFLE | 97 | 1917.1 | |
| RIFFLE | 107 | 2066 | |
| RIFFLE | 117 | 2205.6 | |
| RIFFLE | 127 | 2353.2 | |
| RIFFLE | 137 | 2547 | |
| CASCADE | 147 | 2773.9 | |
| RIFFLE | 157 | 2926.1 | |
| RIFFLE | 166 | 3128 | |
| RIFFLE | 177 | 3275.4 | |
| RIFFLE | 187 | 3492.5 | |
| CASCADE | 197 | 3638.7 | |
| CASCADE | 207 | 3850 | |
| FALL | | 3896.8 | 4M |

| Stream: | Low Place Run |
|-------------------------------|--|
| District: | Dry River |
| USGS Quadrangle: | Brandywine |
| Survey Date: | 11/05/04 |
| Downstream Starting Point: | 17 662776E 4275015N: Forest Service Boundary |
| Total Distance Surveyed (km): | 3.9 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 10 | 90 |
| Total Area (m ²): | 1663±78 | 15276±1099 |
| Correction Factor Applied: | 1.03 | 1.19 |
| Number of Paired Samples: | 6 | 6 |
| Total Count: | 56 | 60 |
| Number per km: | 14 | 15 |
| Mean Area (m ²): | 30 | 255 |
| Mean Maximum Depth (cm): | 75 | 38 |
| Mean Average Depth (cm): | 52 | 19 |
| Mean Residual Depth (cm): | 34 | -- |
| Percent Surveyed as Glides: | 0 | -- |
| Percent Surveyed as Runs: | -- | 0 |
| Percent Surveyed as Cascades: | -- | 7 |
| Percent with >35% Fines: | 2 | 0 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 39 |
| < 5 m long, > 55 cm diameter: | 4 |
| > 5 m long, 10 cm – 55 cm diameter: | 31 |
| > 5 m long, > 55 cm diameter: | 13 |
| Total: | 88 |

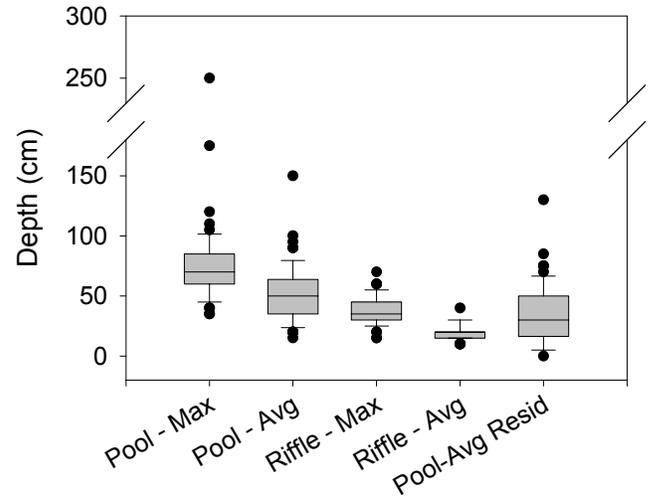
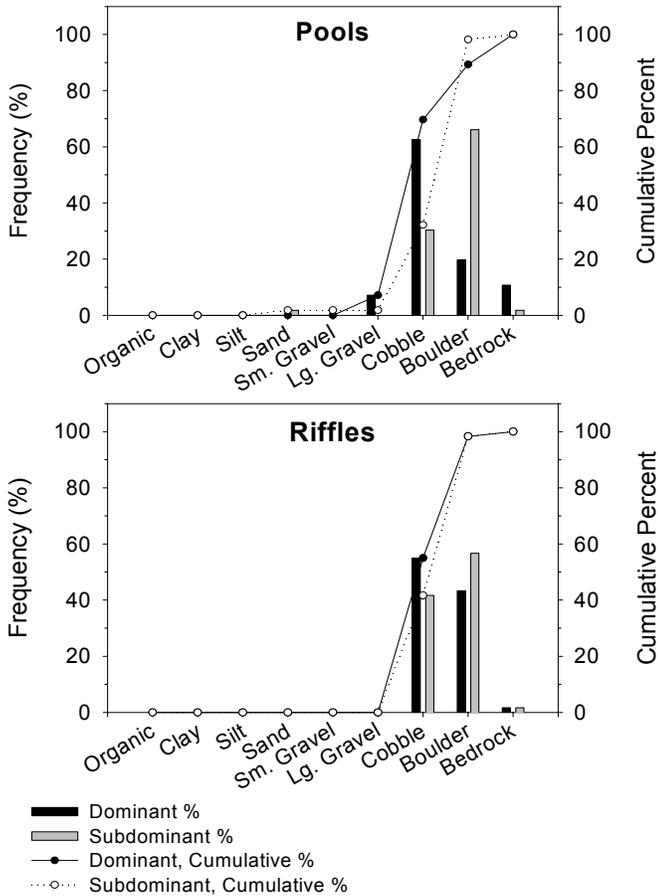
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 26 | 9 |
| Maximum | 46 | 25 |
| 75 th Percentile | 33 | 13 |
| 25 th Percentile | 17 | 4 |
| Minimum | 11 | 1 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

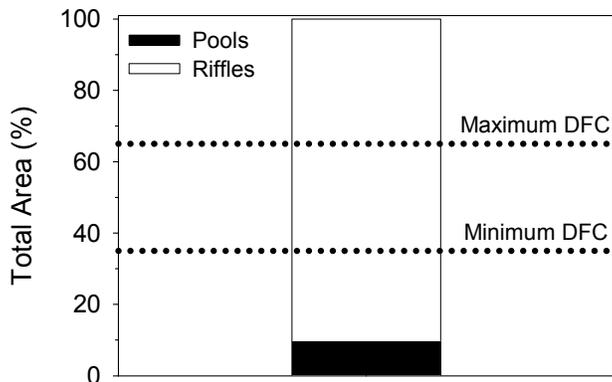
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 44 |
| B: | 56 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|-----|
| Mean Bankfull Channel Width (m): | 8 |
| Mean Channel Gradient (%): | 9 |
| Median Water Temperature (C): | 9.5 |

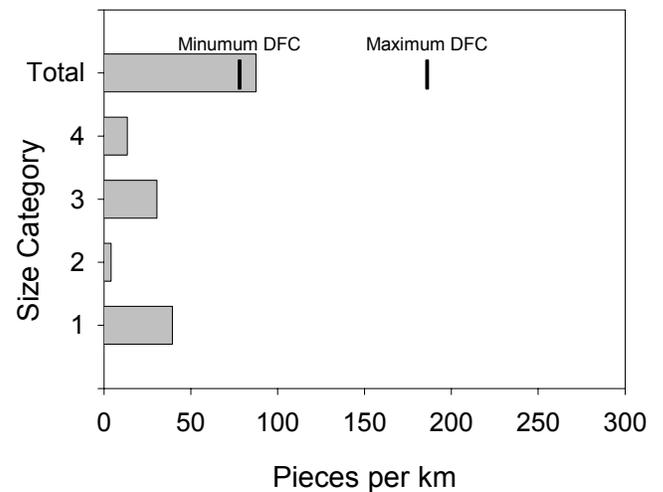


Maximum and average depths and residual pool depths for pools and riffles in Low Place Run, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Low Place Run, summer 2004.



Estimated area of Low Place Run in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Low Place Run, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Low Place Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|--------------------------------------|
| SIDE CHANNEL | 1390.5 | | IN ON LEFT |
| OTHER | 1521.1 | | 2 LARGE BROOK TROUT ON SPAWNING REDD |
| TRIBUTARY | 1790.7 | 2.5 | IN ON LEFT |
| BRAID | 1849.2 | | |
| LANDSLIDE | 1967.9 | | ON LEFT, 20M LONG |
| SIDE CHANNEL | 2202.5 | | IN ON RIGHT |
| SIDE CHANNEL | 2239.2 | | OUT ON RIGHT |
| SIDE CHANNEL | 2962.2 | | IN ON LEFT |
| TRIBUTARY | 2962.2 | | DRY, IN ON LEFT |
| SIDE CHANNEL | 2987.2 | | OUT ON LEFT |
| SEEP | 3018.2 | | DRY GULLY DOWN SIDE OF MOUNTAIN |
| SIDE CHANNEL | 3020.2 | | IN ON LEFT |
| SIDE CHANNEL | 3054.4 | | OUT ON LEFT |
| FALL | 3208 | | 1M HIGH |
| FALL | 3251.2 | | 1M HIGH |
| SIDE CHANNEL | 3799.2 | | IN ON RIGHT |
| SIDE CHANNEL | 3821.9 | | OUT ON RIGHT |
| TRIBUTARY | 3857.2 | | DRY, IN ON RIGHT |

Stream crossings encountered on Low Place Run during BVET habitat inventory, summer 2004.
Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

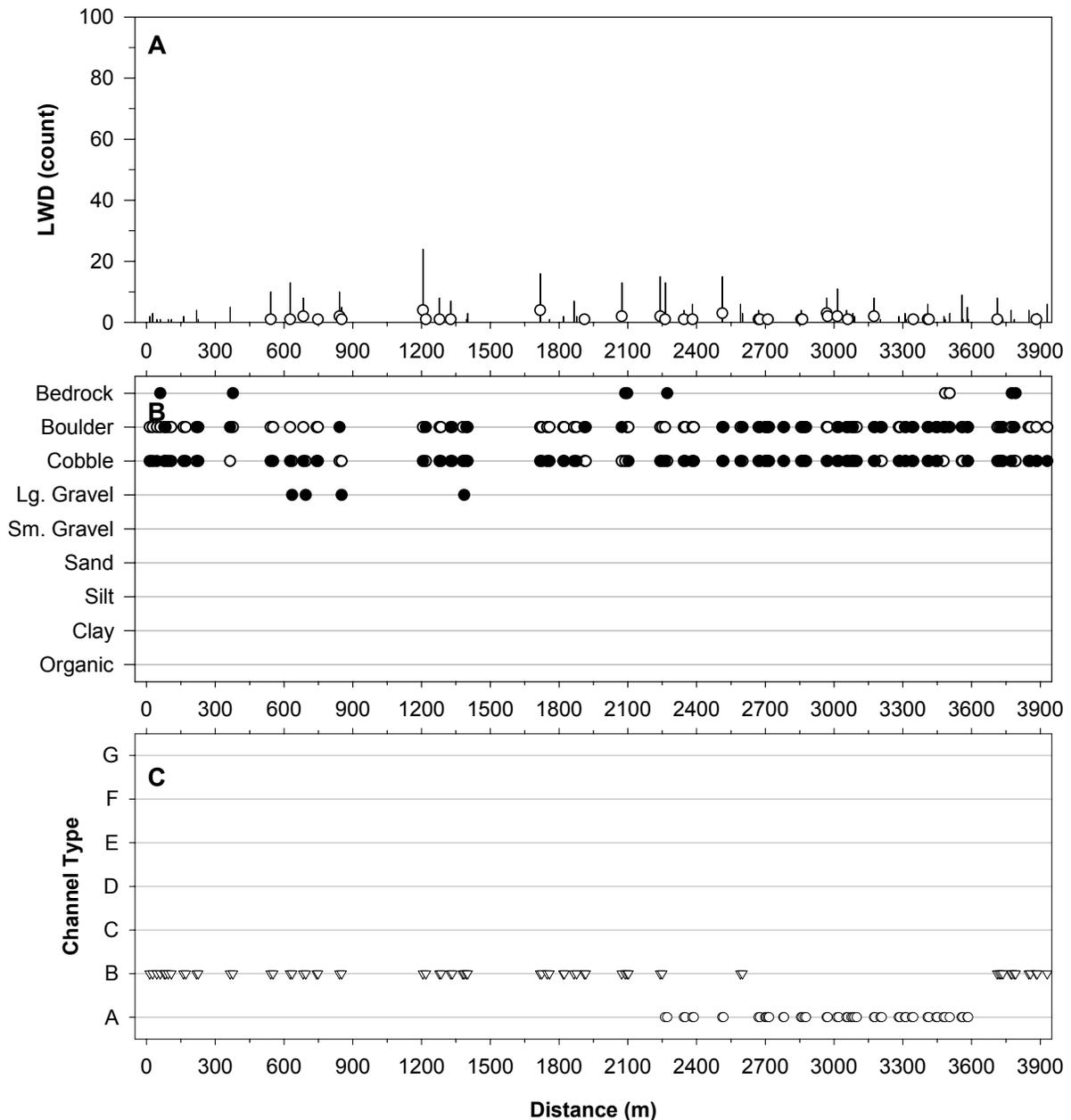
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

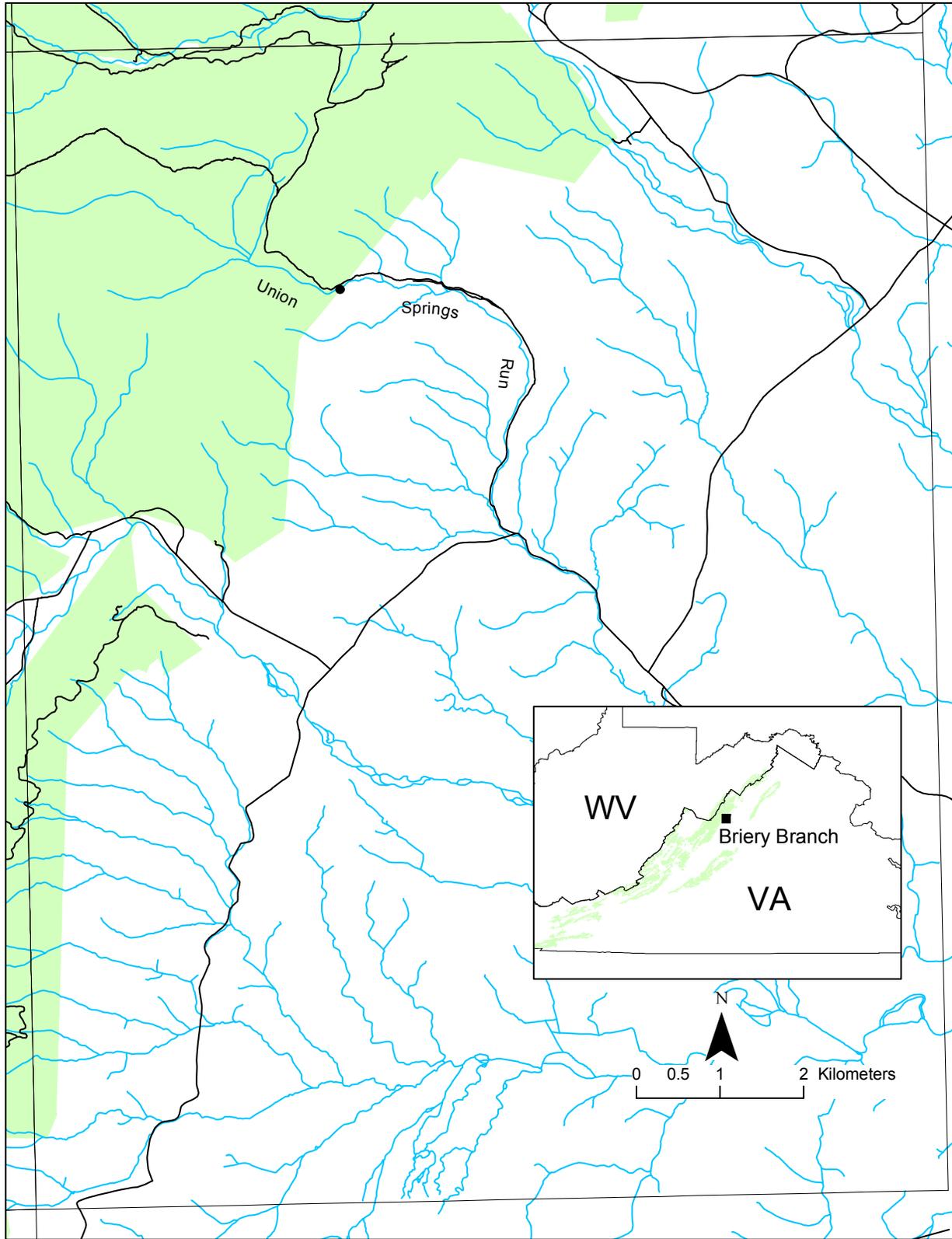
Comments:



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Low Place Run, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from Forest Service Boundary. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Low Place Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|---------------------------|
| RIFFLE | 4 | 94.7 | |
| RIFFLE | 14 | 1278.3 | |
| CASCADE | 24 | 2097.7 | |
| RIFFLE | 34 | 2710.7 | |
| RIFFLE | 44 | 3202.2 | |
| RIFFLE | 54 | 3712.2 | ABRUPT CHANGE IN GRADIENT |



Streams inventoried on the Briery Branch Quadrangle using BVET habitat surveys during summer 2004.

| | |
|-------------------------------|--|
| Stream: | Union Springs Run |
| District: | Dry River |
| USGS Quadrangle: | Briery Branch |
| Survey Date: | 08/02/04 |
| Downstream Starting Point: | 17 4260011N 667526E: Forest Service Boundary |
| Total Distance Surveyed (km): | 2.3 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 51 | 49 |
| Total Area (m ²): | 3082±635 | 2912±712 |
| Correction Factor Applied: | 1.39 | 1.10 |
| Number of Paired Samples: | 4 | 5 |
| Total Count: | 53 | 49 |
| Number per km: | 23 | 21 |
| Mean Area (m ²): | 56 | 59 |
| Mean Maximum Depth (cm): | 38 | 17 |
| Mean Average Depth (cm): | 19 | 9 |
| Mean Residual Depth (cm): | 12 | -- |
| Percent Surveyed as Glides: | 2 | -- |
| Percent Surveyed as Runs: | -- | 2 |
| Percent Surveyed as Cascades: | -- | 2 |
| Percent with >35% Fines: | 4 | 2 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 24 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 30 |
| > 5 m long, > 55 cm diameter: | 7 |
| Total: | 61 |

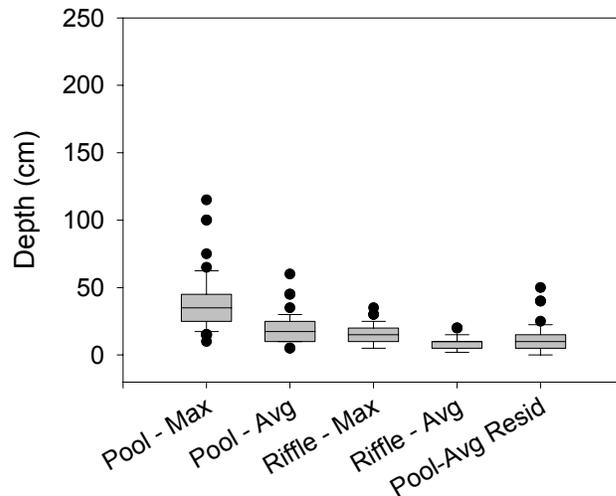
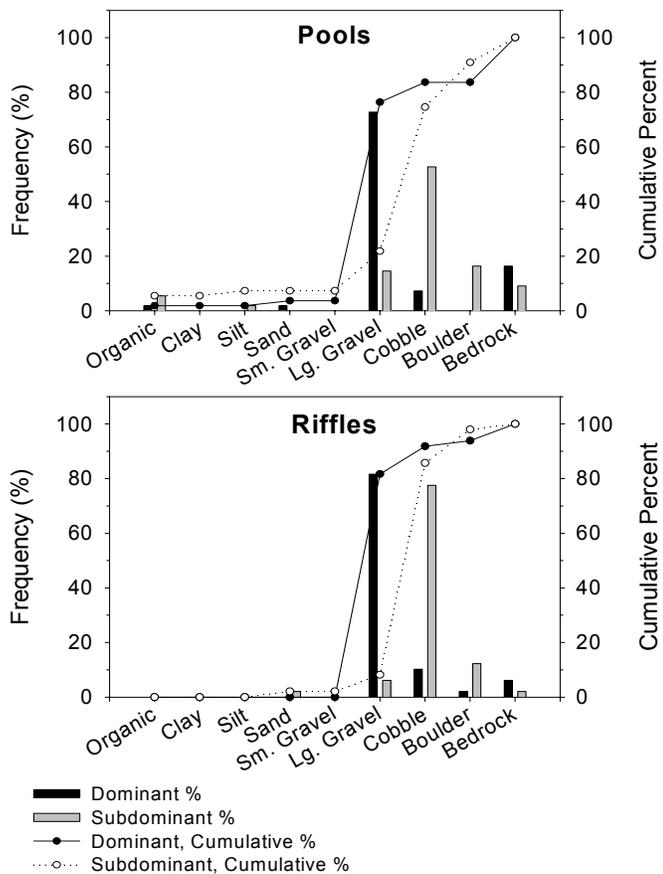
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 9 | 2 |
| Maximum | 14 | 6 |
| 75 th Percentile | 13 | 3 |
| 25 th Percentile | 4 | 1 |
| Minimum | 4 | 0 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

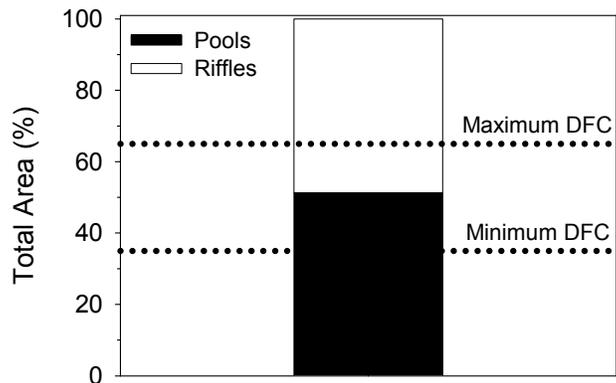
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 0 |
| B: | 62 |
| C: | 38 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 5 |
| Mean Channel Gradient (%): | 4 |
| Median Water Temperature (C): | 18 |

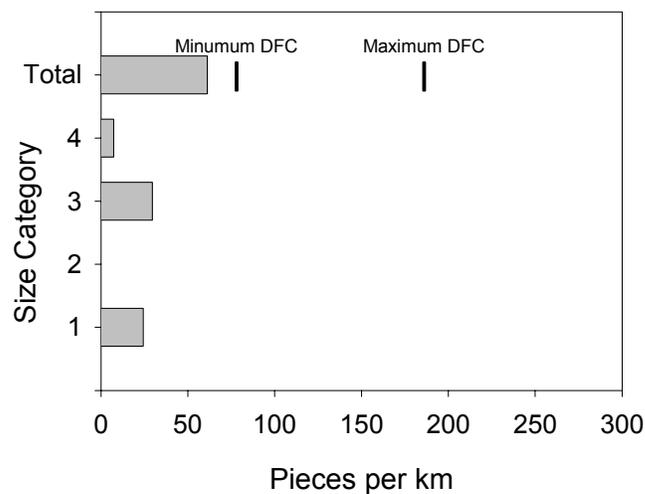


Maximum and average depths and residual pool depths for pools and riffles in Union Springs Run, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Union Springs Run, summer 2004.



Estimated area of Union Springs Run in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Union Springs Run, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Union Springs Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|---|
| SIDE CHANNEL | 258.7 | | IN ON LEFT |
| SIDE CHANNEL | 447.6 | | IN ON RIGHT |
| SIDE CHANNEL | 479.85 | | OUT ON LEFT |
| SIDE CHANNEL | 479.5 | | OUT ON RIGHT |
| SIDE CHANNEL | 1626.4 | | IN ON RIGHT |
| SIDE CHANNEL | 1638.1 | | OUT ON RIGHT |
| SIDE CHANNEL | 1702.5 | | IN ON LEFT |
| TRIBUTARY | 1181.2 | 0.3 | IN ON LEFT |
| TRIBUTARY | 1213.3 | 0.5 | IN ON LEFT |
| TRIBUTARY | 1259.2 | | IN ON RIGHT, DRY |
| TRIBUTARY | 1497 | 0.2 | IN ON LEFT |
| TRIBUTARY | 1573.6 | | IN ON RIGHT, TRICKLE |
| UNDERGROUND | 2300 | | FROM 1741.8 M TO 2300 M: GREATER THAN 500M UNDERGROUND, END TIME 1630 |

Stream crossings encountered on Union Springs Run during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

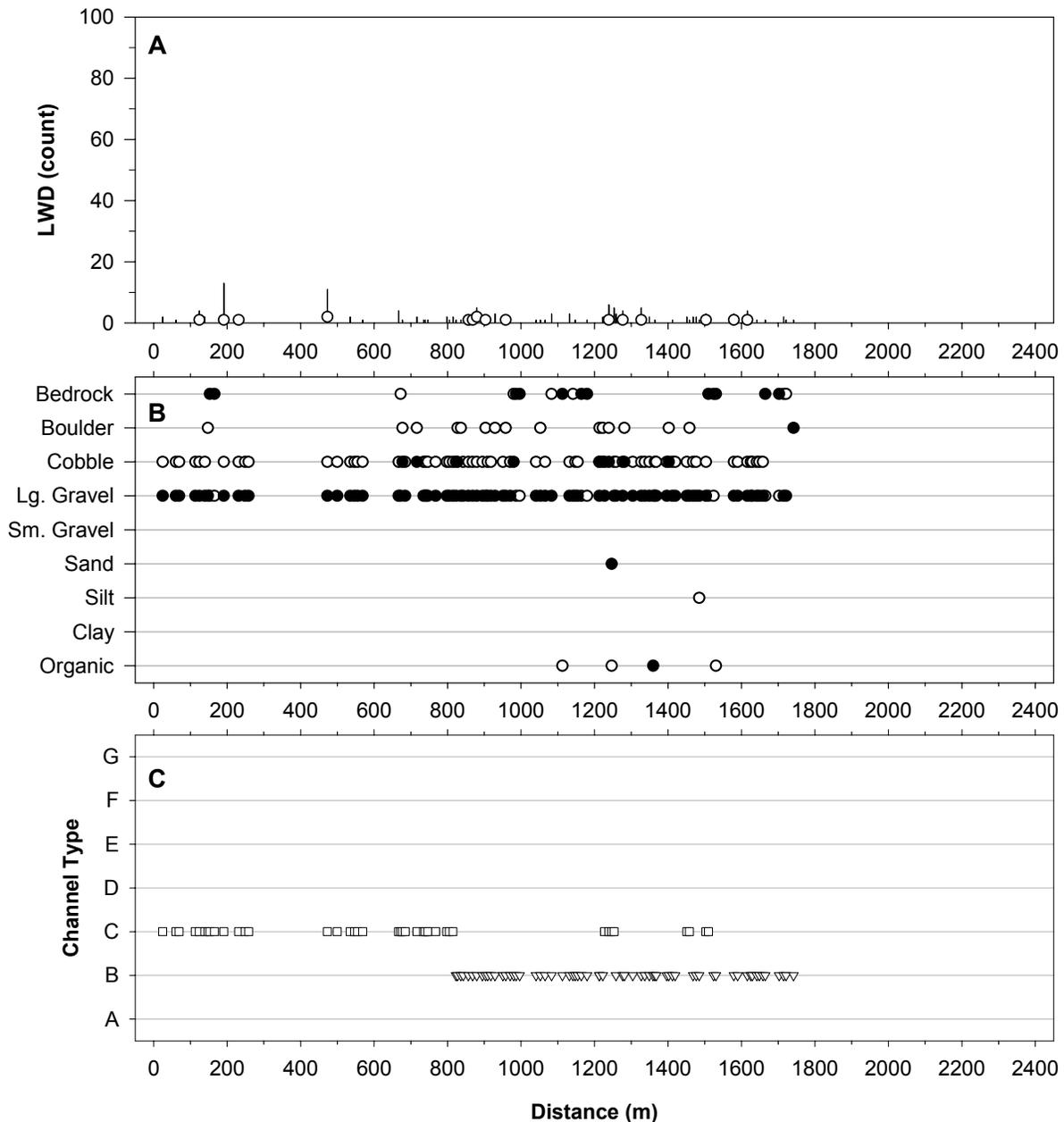
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

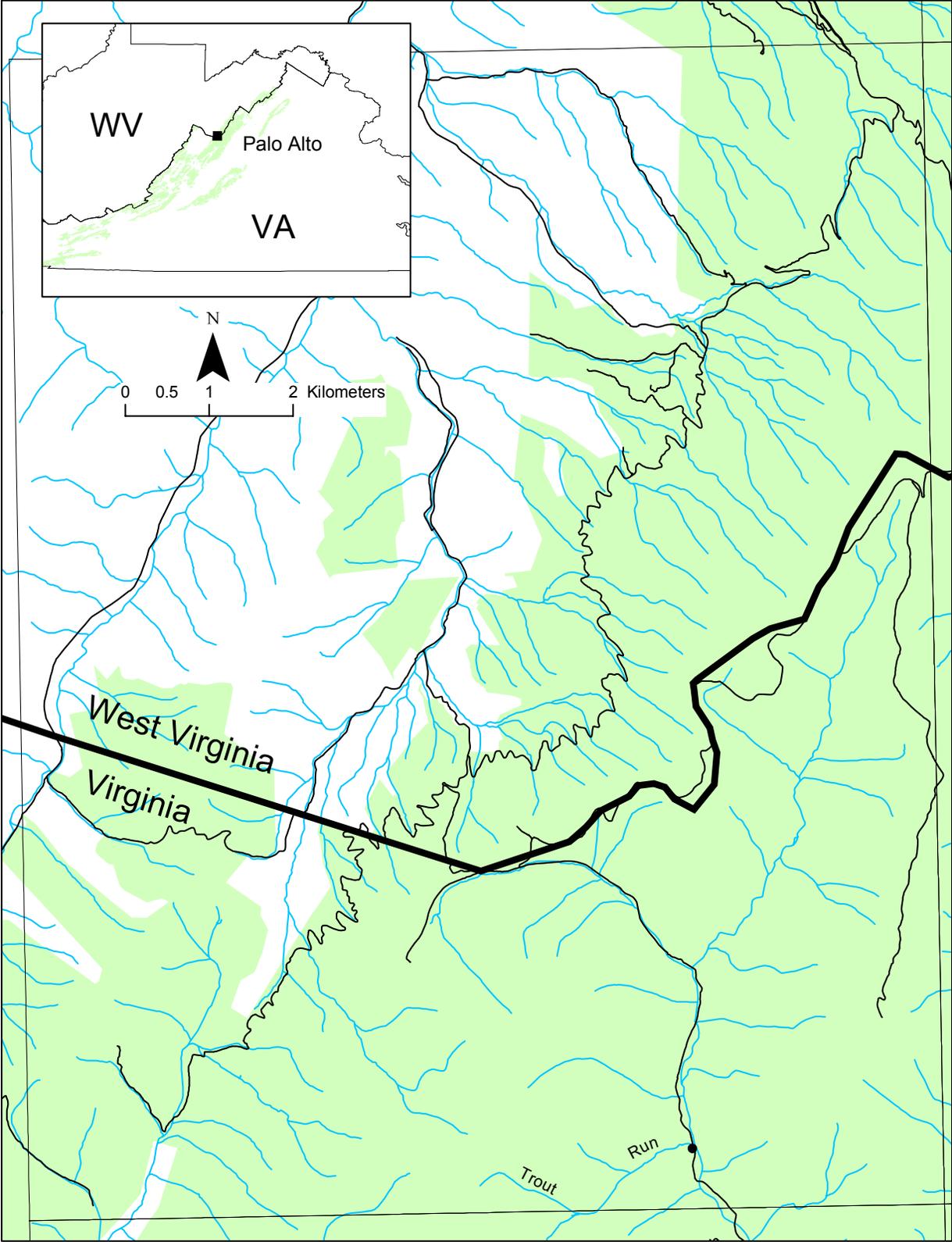
Comments:



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Union Springs Run, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from Forest Service Boundary. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Union Springs Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-----------------|
| RIFFLE | 8 | 535.4 | |
| RIFFLE | 18 | 868.5 | |
| RIFFLE | 28 | 1222.6 | |
| RIFFLE | 38 | 1451.5 | |
| RIFFLE | 48 | 1721.4 | |



Streams inventoried on the Palo Alto Quadrangle using BVET habitat surveys during summer 2004.

| Stream: | Trout Run |
|-------------------------------|--|
| District: | Dry River |
| USGS Quadrangle: | Palo Alto |
| Survey Date: | 06/29/04 |
| Downstream Starting Point: | 17 4249443N 649789E: confluence of North River and Trout Run |
| Total Distance Surveyed (km): | 2.4 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 21 | 79 |
| Total Area (m ²): | 1058±119 | 3886±1841 |
| Correction Factor Applied: | 1.07 | 0.92 |
| Number of Paired Samples: | 7 | 6 |
| Total Count: | 70 | 66 |
| Number per km: | 29 | 28 |
| Mean Area (m ²): | 15 | 59 |
| Mean Maximum Depth (cm): | 34 | 20 |
| Mean Average Depth (cm): | 21 | 9 |
| Mean Residual Depth (cm): | 14 | -- |
| Percent Surveyed as Glides: | 6 | -- |
| Percent Surveyed as Runs: | -- | 2 |
| Percent Surveyed as Cascades: | -- | 2 |
| Percent with >35% Fines: | 20 | 2 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 36 |
| < 5 m long, > 55 cm diameter: | 1 |
| > 5 m long, 10 cm – 55 cm diameter: | 23 |
| > 5 m long, > 55 cm diameter: | 5 |
| Total: | 65 |

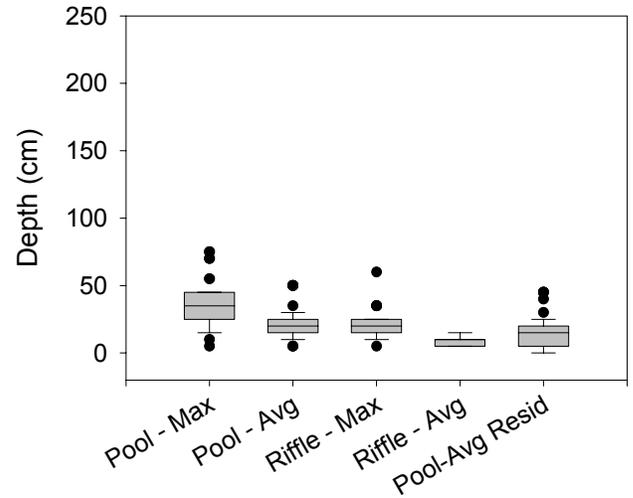
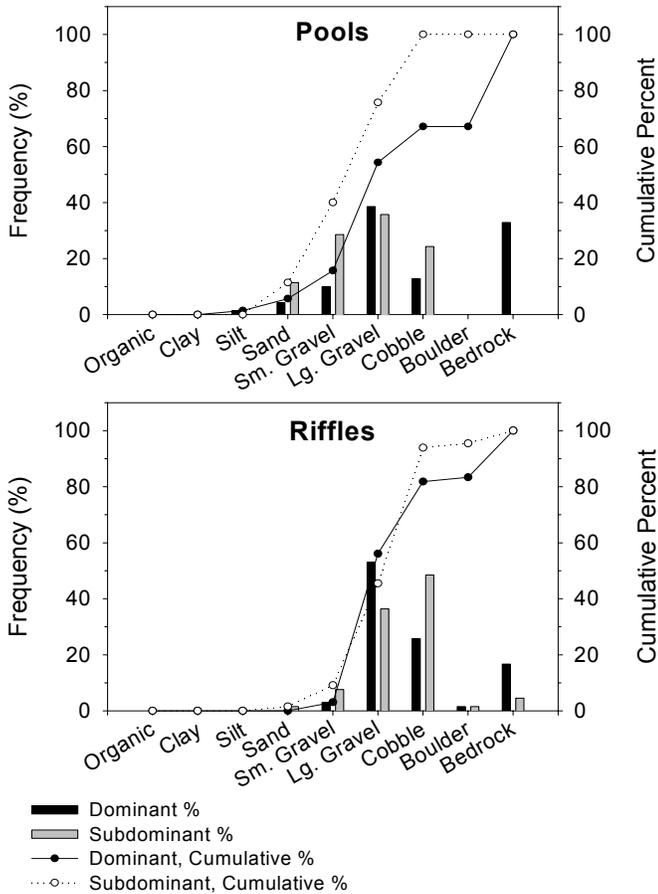
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 9 | 1 |
| Maximum | 15 | 6 |
| 75 th Percentile | 11 | 1 |
| 25 th Percentile | 8 | 1 |
| Minimum | 6 | 0 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

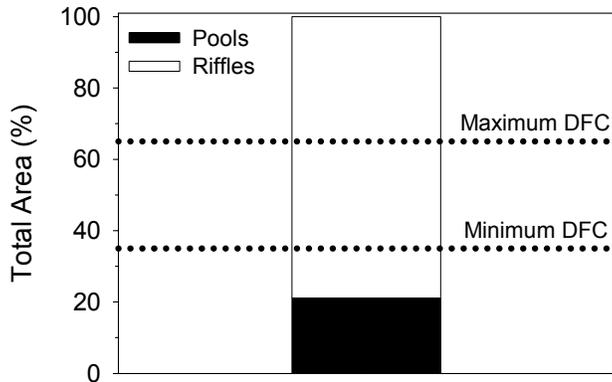
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 100 |
| B: | 0 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|------|
| Mean Bankfull Channel Width (m): | 7 |
| Mean Channel Gradient (%): | 4 |
| Median Water Temperature (C): | 14.5 |

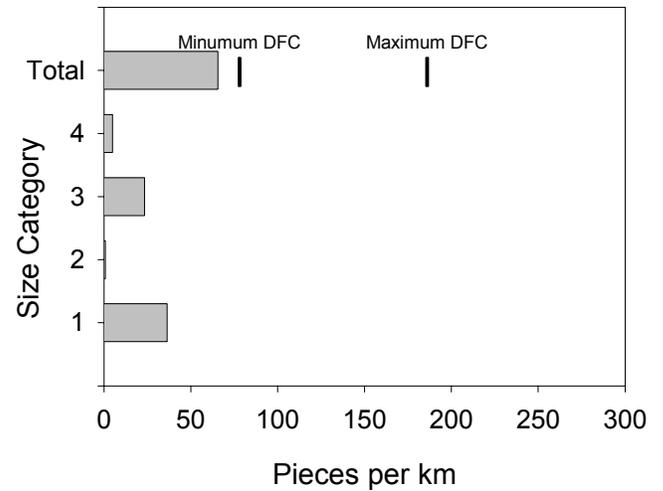


Maximum and average depths and residual pool depths for pools and riffles in Trout Run, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Trout Run, summer 2004.



Estimated area of Trout Run, in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Trout Run, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

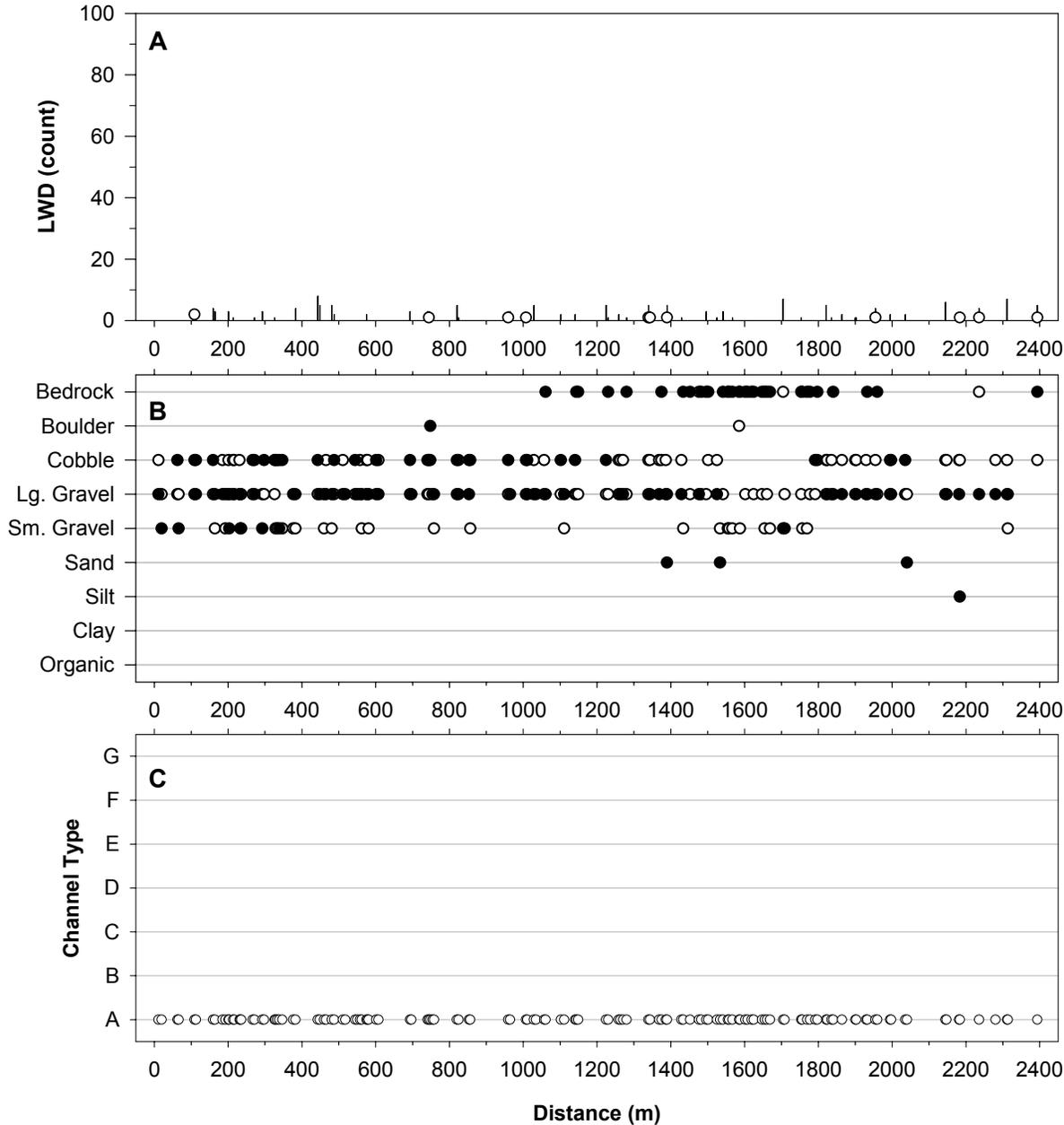
- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Trout Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|-----------------------------|
| BRIDGE | 68.3 | | |
| SIDE CHANNEL | 221.7 | | IN ON LEFT, DRY |
| SIDE CHANNEL | 239.1 | | DEBRIS JAM, DRY OUT ON LEFT |
| TRIBUTARY | 894.3 | 1 | ON LEFT |
| SIDE CHANNEL | 1045 | | IN ON LEFT |
| SIDE CHANNEL | 1056.7 | | OUT ON LEFT |
| SIDE CHANNEL | 1317 | | IN ON RIGHT |
| UNDERGROUND | 1460.7 | | FROM 1452 M TO 1461 M |
| SIDE CHANNEL | 1807 | | IN ON RIGHT |
| SIDE CHANNEL | 1820.8 | | OUT ON RIGHT |
| TRIBUTARY | 1829 | 1.5 | IN ON LEFT |
| SEEP | 1850 | | ON RIGHT |
| UNDERGROUND | 1878.2 | | FROM 1864 M TO 1878 M |
| TRIBUTARY | 2116.6 | 1 | IN ON LEFT |
| UNDERGROUND | 2245.5 | | FROM 2236 M TO 2246 M |

Stream crossings encountered on Trout Run during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

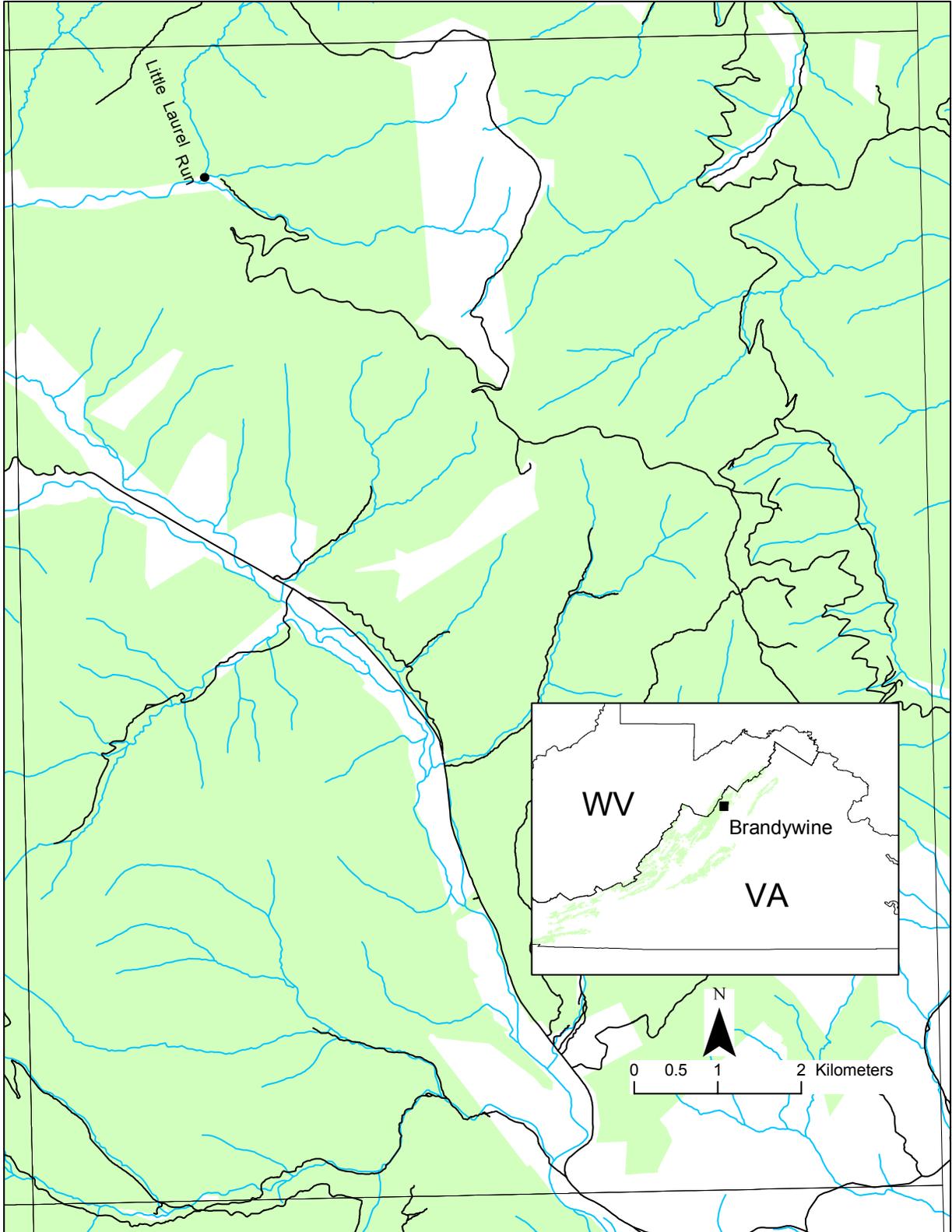
| | |
|-------------------------|--------------------|
| Crossing type: | Bridge |
| Distance (m): | 68.3 |
| Road number/trail name: | 95 |
| Culvert type: | Metal pipe |
| Culvert outlets (n): | 1 |
| Culvert diameter (cm): | 360 |
| Culvert height (cm): | 210 |
| Culvert material: | Metal and concrete |
| Culvert perch (cm): | 25 |
| Substrate (y/n): | N |
| Photos (y/n): | Y |
| Comments: | none |



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Trout Run summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from confluence of North River and Trout Run. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Trout Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-----------------|
| RIFFLE | 6 | 201.1 | |
| RIFFLE | 16 | 510.9 | |
| RIFFLE | 26 | 1007.7 | |
| RIFFLE | 36 | 1386.6 | |
| RIFFLE | 46 | 1647.2 | |
| RIFFLE | 56 | 1929.3 | |



Streams inventoried on the Rawley Springs Quadrangle using BVET habitat surveys during summer 2004.

| | |
|-------------------------------|---|
| Stream: | Little Laurel Run |
| District: | Dry River |
| USGS Quadrangle: | Rawley Springs |
| Survey Date: | 06/29/04 |
| Downstream Starting Point: | Forest Service Boundary just north of tributary of Sand Run which enters on right |
| Total Distance Surveyed (km): | 0.5 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | NA | NA |
| Total Area (m ²): | NA | NA |
| Correction Factor Applied: | NA | NA |
| Number of Paired Samples: | 0 | 0 |
| Total Count: | 4 | 6 |
| Number per km: | 8 | 11 |
| Mean Area (m ²): | NA | NA |
| Mean Maximum Depth (cm): | 34 | 13 |
| Mean Average Depth (cm): | 20 | 7 |
| Mean Residual Depth (cm): | 11 | -- |
| Percent Surveyed as Glides: | 0 | -- |
| Percent Surveyed as Runs: | -- | 0 |
| Percent Surveyed as Cascades: | -- | 0 |
| Percent with >35% Fines: | 0 | 0 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 98 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 141 |
| > 5 m long, > 55 cm diameter: | 85 |
| Total: | 324 |

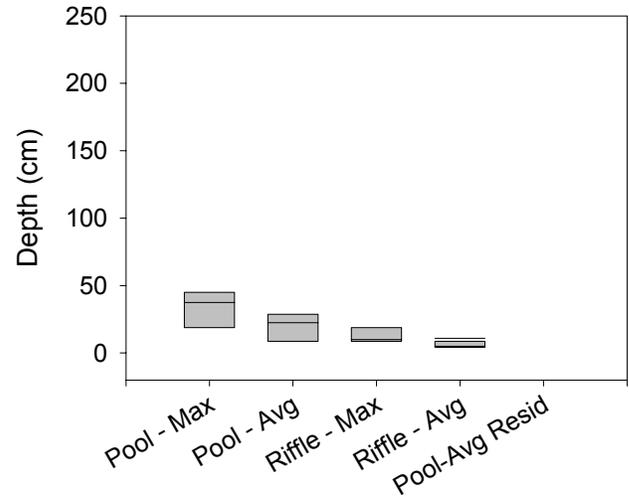
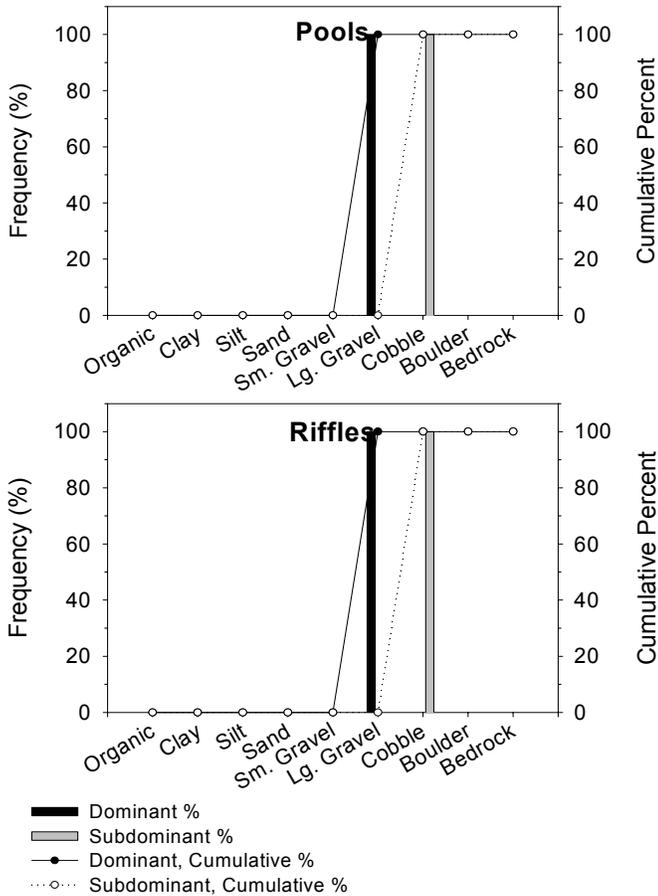
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | NA | NA |
| Maximum | NA | NA |
| 75 th Percentile | NA | NA |
| 25 th Percentile | NA | NA |
| Minimum | NA | NA |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

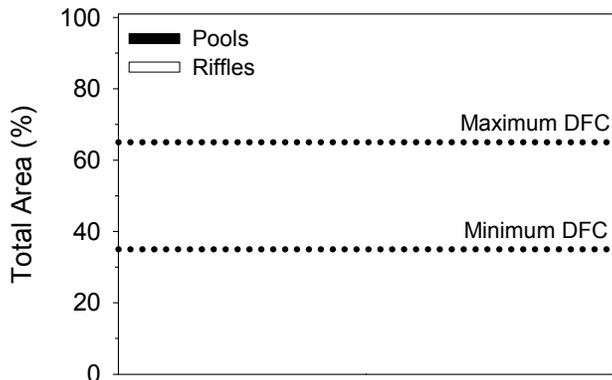
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 0 |
| B: | 0 |
| C: | 100 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | NA |
| Mean Channel Gradient (%): | NA |
| Median Water Temperature (C): | NA |

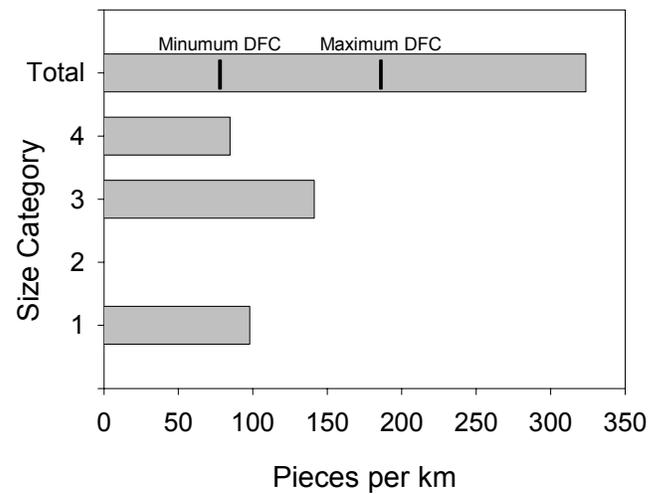


Maximum and average depths and residual pool depths for pools and riffles in Little Laurel Run, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Little Laurel Run, summer 2004.



Estimated area of Little Laurel Run in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools. (could not calculate, lack of paired samples)



LWD per kilometer in Little Laurel Run, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Little Laurel Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|---------------------------|
| UNDERGROUND | 171.2 | | |
| SIDE CHANNEL | 231.7 | | IN ON LEFT |
| UNDERGROUND | 260.6 | | |
| SIDE CHANNEL | 265 | | OUT ON LEFT |
| SIDE CHANNEL | 304 | | IN ON LEFT |
| SIDE CHANNEL | 309 | | OUT ON LEFT |
| UNDERGROUND | 405.5 | | |
| UNDERGROUND | 492.2 | | DEBRIS JAM, BOTTOM OF DRY |

Stream crossings encountered on Little Laurel Run during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

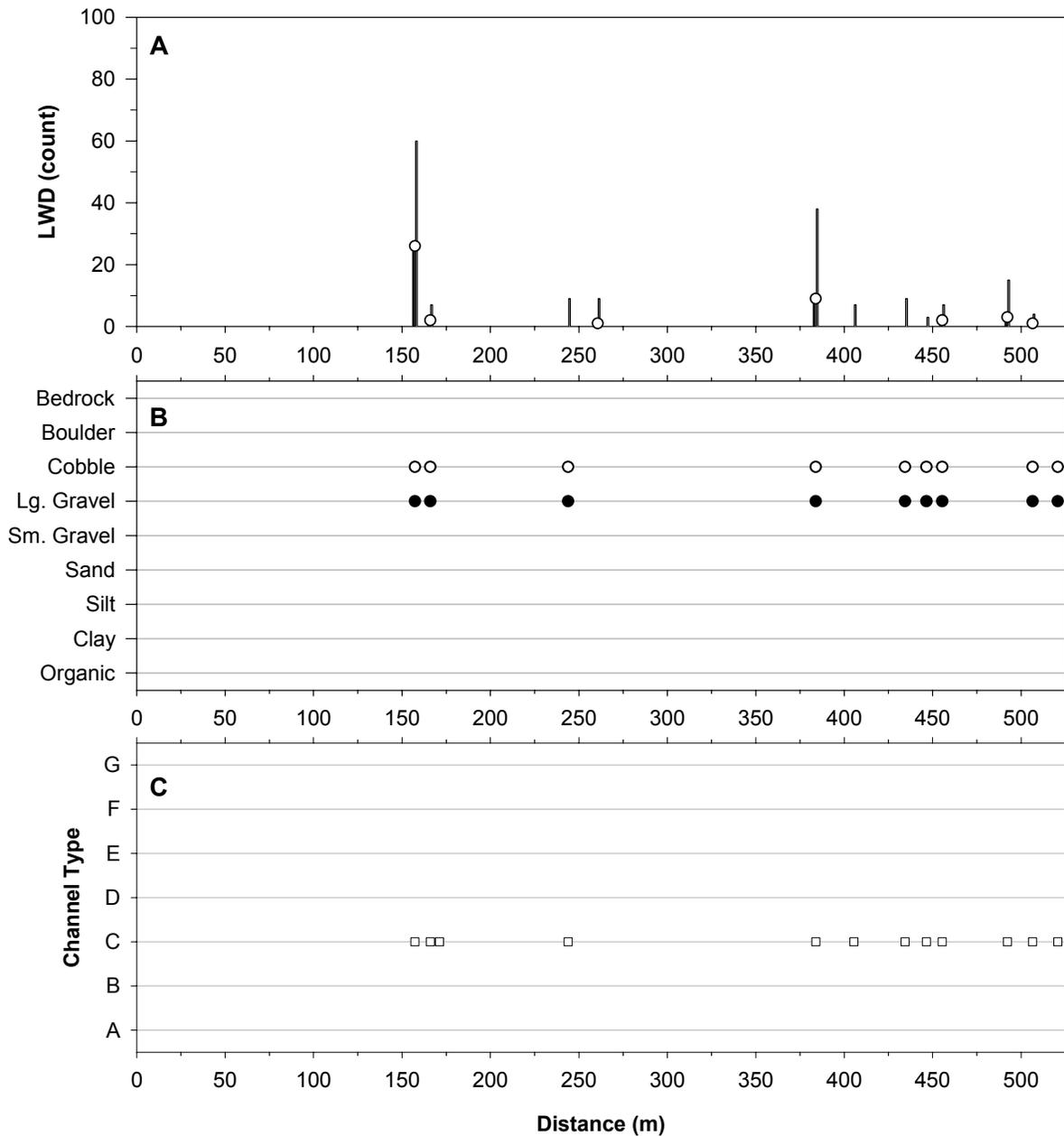
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

Comments:



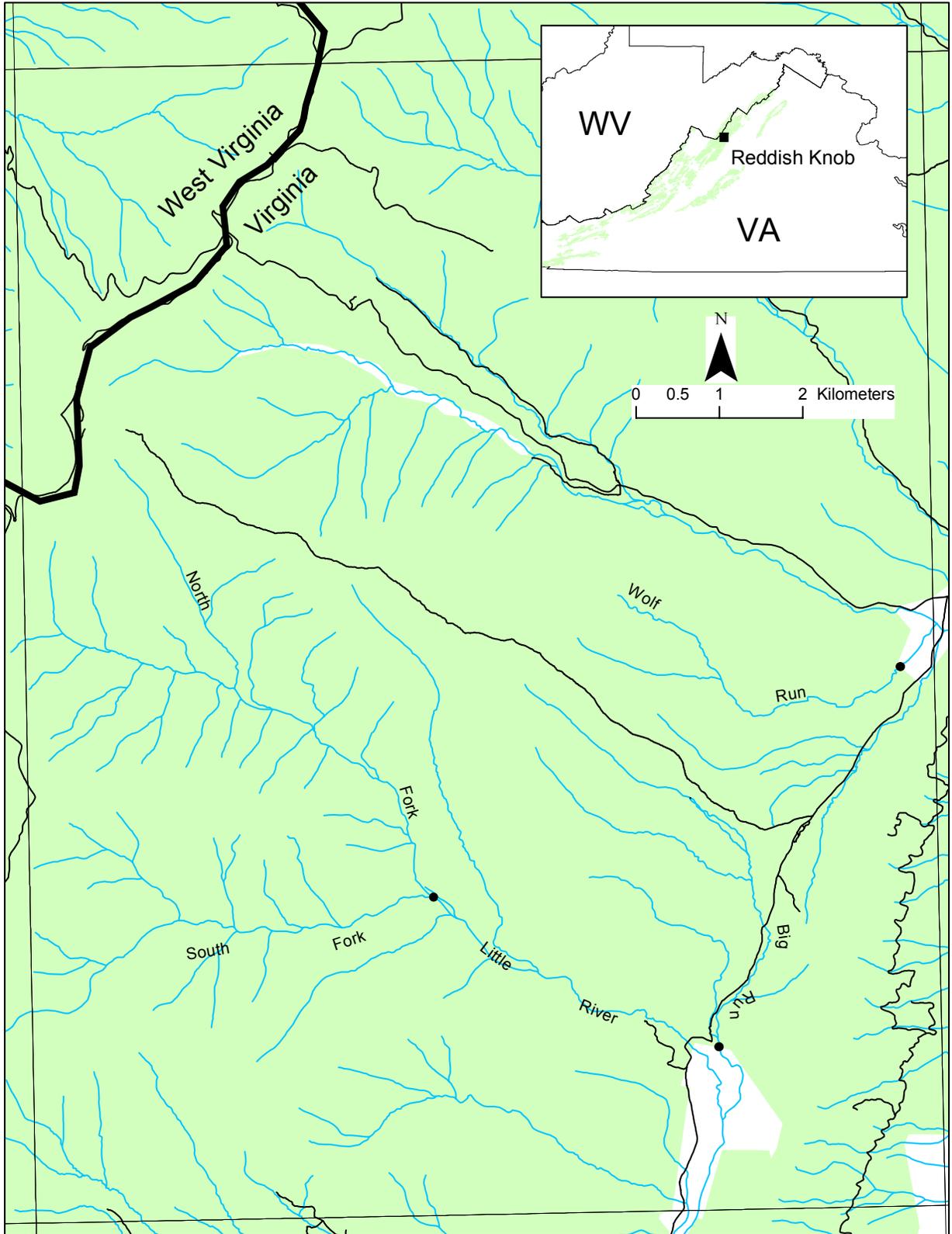
Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Little Laurel Run, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from Forest Service Boundary just north of tributary of Sand Run which enters on right. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Rawley Springs

Photos taken on Little Laurel Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-----------------|
|------------------|--------------------|---------------------|-----------------|

*no photos taken



Streams inventoried on the Reddish Knob Quadrangle using BVET habitat surveys during summer 2004.

| | |
|-------------------------------|---|
| Stream: | Big Run |
| District: | Dry River |
| USGS Quadrangle: | Reddish Knob |
| Survey Date: | 06/30/04 |
| Downstream Starting Point: | 4250807N 661004E: Forest Service Boundary about 40 meters down stream of trail number 432 |
| Total Distance Surveyed (km): | 5.6 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 28 | 72 |
| Total Area (m ²): | 2067±203 | 5411±995 |
| Correction Factor Applied: | 0.92 | 1.42 |
| Number of Paired Samples: | 7 | 7 |
| Total Count: | 68 | 73 |
| Number per km: | 12 | 13 |
| Mean Area (m ²): | 30 | 74 |
| Mean Maximum Depth (cm): | 40 | 16 |
| Mean Average Depth (cm): | 26 | 8 |
| Mean Residual Depth (cm): | 18 | -- |
| Percent Surveyed as Glides: | 12 | -- |
| Percent Surveyed as Runs: | -- | 3 |
| Percent Surveyed as Cascades: | -- | 1 |
| Percent with >35% Fines: | 7 | 1 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 30 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 33 |
| > 5 m long, > 55 cm diameter: | 2 |
| Total: | 65 |

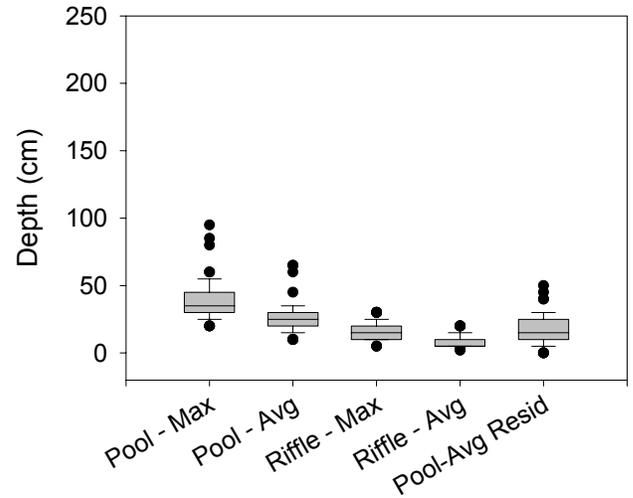
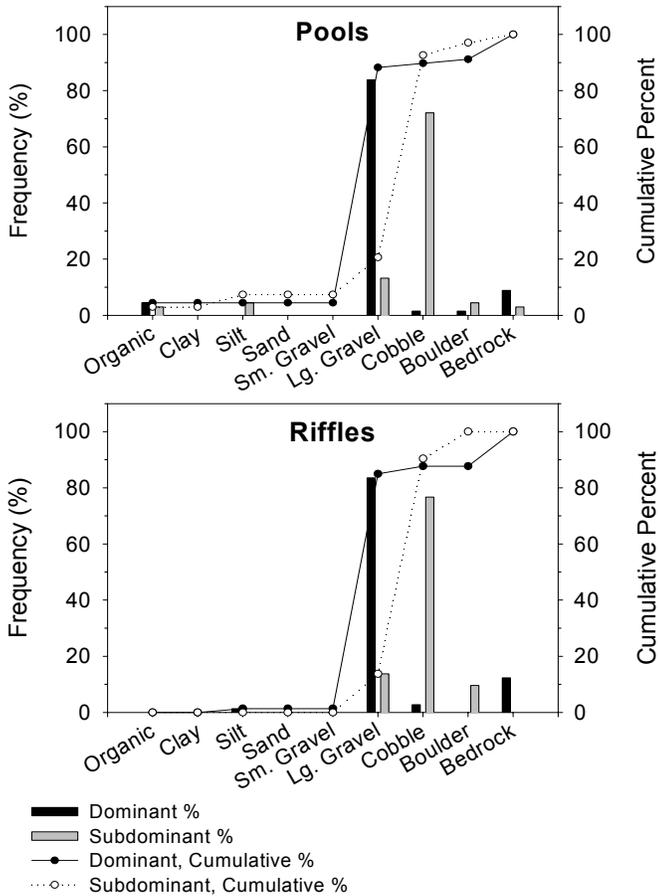
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 35 | 14 |
| Maximum | 124 | 80 |
| 75 th Percentile | 41 | 22 |
| 25 th Percentile | 8 | 0 |
| Minimum | 4 | 0 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

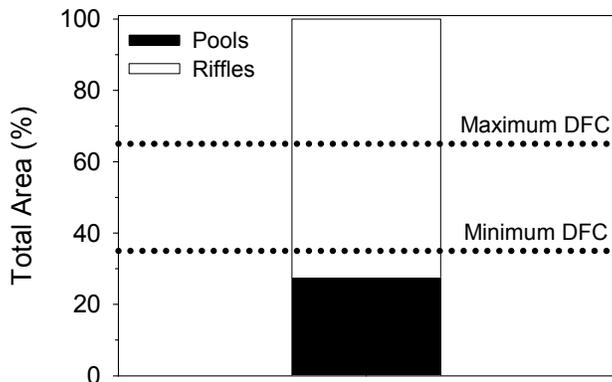
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 10 |
| B: | 14 |
| C: | 74 |
| D: | 0 |
| E: | 0 |
| F: | 1 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 6 |
| Mean Channel Gradient (%): | 4 |
| Median Water Temperature (C): | 12 |

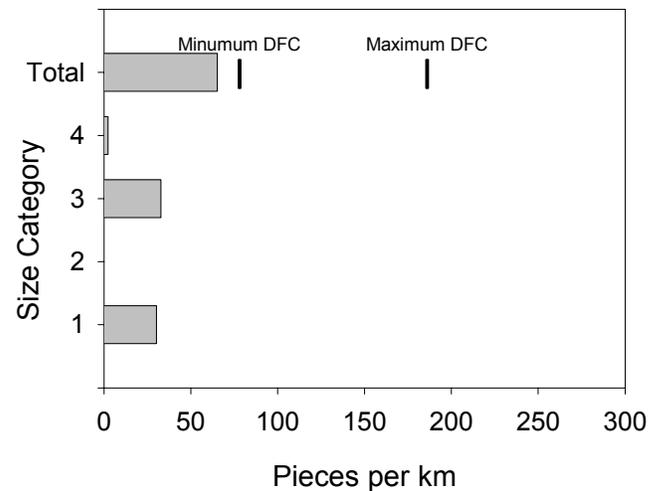


Maximum and average depths and residual pool depths for pools and riffles in Big Run, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Big Run, summer 2004.



Estimated area of Big Run in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Big Run, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

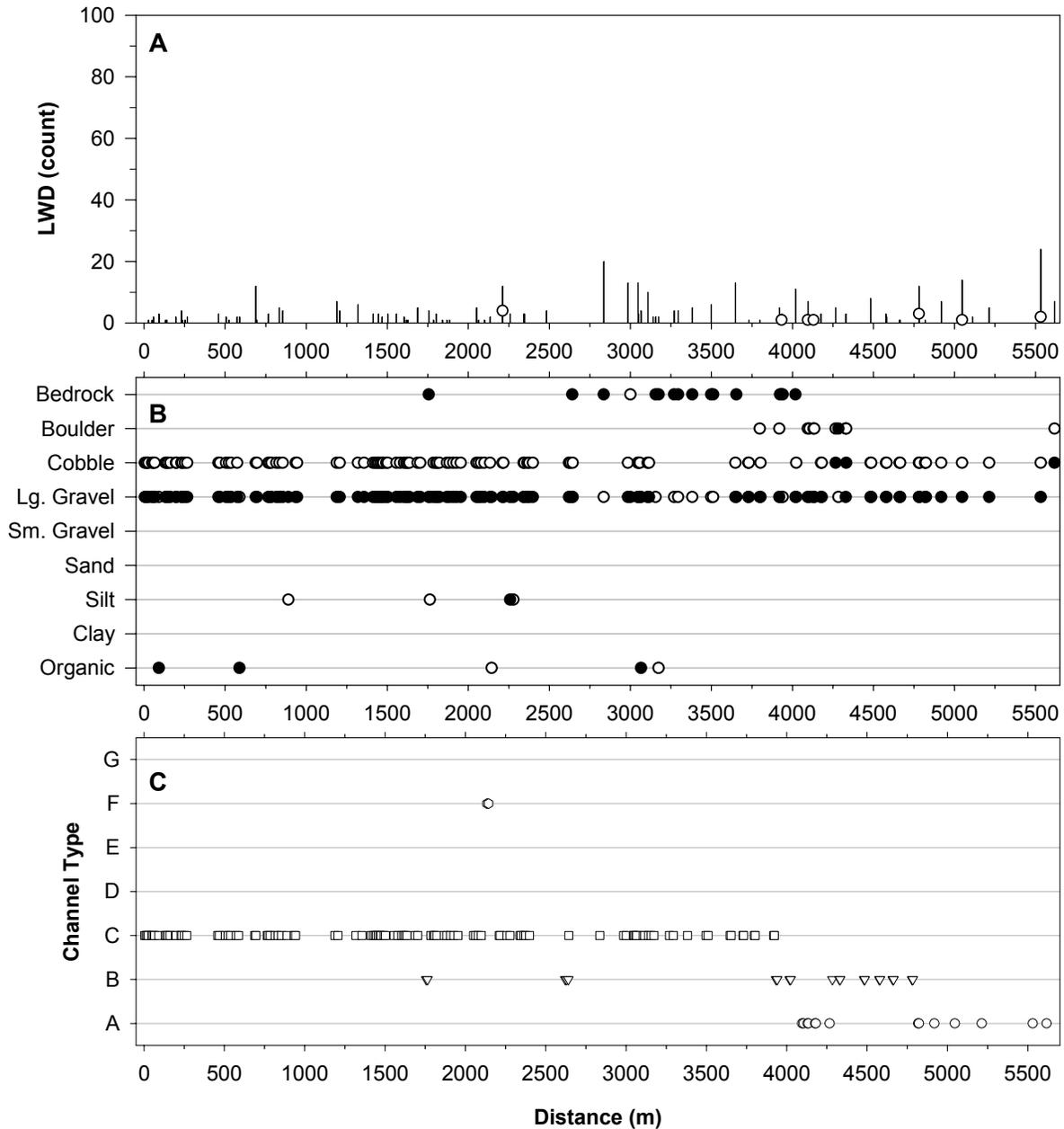
- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Big Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|--|
| TRIBUTARY | 114.7 | 0.5 | IN ON RIGHT |
| TRIBUTARY | 148.7 | | DRY, IN ON LEFT |
| TRIBUTARY | 199.5 | 0.75 | IN ON LEFT |
| SIDE CHANNEL | 274.1 | | IN ON RIGHT |
| SIDE CHANNEL | 316.9 | | OUT ON RIGHT |
| SIDE CHANNEL | 564.5 | | IN ON RIGHT |
| SIDE CHANNEL | 573.8 | | OUT ON RIGHT |
| TRIBUTARY | 706.7 | 0.2 | IN ON RIGHT |
| SIDE CHANNEL | 763.2 | | IN ON LEFT |
| SIDE CHANNEL | 795.4 | | OUT ON LEFT |
| SIDE CHANNEL | 815.9 | | IN ON RIGHT |
| FORD | 861.1 | | NOTHING MAN MADE, OVER NATURAL SUBSTRATE |
| TRIBUTARY | 986 | 0.1 | IN ON LEFT |
| FORD | 1340.5 | | OLD ROAD NOW CLOSED TO VEHICLES |
| SEEP | 1508 | | ON RIGHT |
| TRIBUTARY | 1711.3 | 1 | IN ON LEFT |
| UNDERGROUND | 1773.4 | | FROM 1763.5 M TO 1773.4 M |
| SIDE CHANNEL | 1817.9 | | IN ON RIGHT |
| UNDERGROUND | 1839.8 | | FROM 1822.2 M TO 1839.8 M |
| CULVERT | 1966.8 | | |
| SIDE CHANNEL | 2102.3 | | IN ON LEFT |
| SEEP | 2111 | | ON LEFT |
| SIDE CHANNEL | 2225 | | IN ON RIGHT |
| SIDE CHANNEL | 2229 | | OUT ON LEFT |
| SIDE CHANNEL | 2251.9 | | OUT ON RIGHT |
| SIDE CHANNEL | 2379.5 | | IN ON LEFT |
| FORD | 2414.9 | | NATURAL SUBSTRATE |
| SIDE CHANNEL | 2482.3 | | OUT ON LEFT |
| UNDERGROUND | 2482.3 | | FROM 2398.6 M TO 2482.3 M |
| TRIBUTARY | 2605.7 | 1.5 | IN ON LEFT |
| SIDE CHANNEL | 3026.2 | | IN ON LEFT |
| SIDE CHANNEL | 3058.4 | | OUT ON LEFT |
| FORD | 3628.5 | | TRAIL CROSSING |
| FORD | 3802.8 | | TRAIL CROSSING |
| FORD | 3910 | | TRAIL CROSSING |
| FORD | 4568.5 | | TRAIL CROSSING |
| SEEP | 4903.4 | | ON LEFT |
| UNDERGROUND | 4979 | | FROM 4918.0 M TO 4979.0 M |
| TRIBUTARY | 5028.4 | | IN ON RIGHT / DRY |
| UNDERGROUND | 5110.6 | | FROM 5046.4 M TO 5110.6 M |
| UNDERGROUND | 5250.7 | | FROM 5213.3 M TO 5250.7 M |
| UNDERGROUND | 5537 | | FROM 5531.3 M TO 5537.0 M |

Stream crossings encountered on Big Run during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

| | |
|-------------------------|----------------|
| Crossing type: | Culvert |
| Distance (m): | 1966.8 |
| Road number/trail name: | Road 101 |
| Culvert type: | Pipe |
| Culvert outlets (n): | 2 |
| Culvert diameter (cm): | 200 each |
| Culvert height (cm): | 150 each |
| Culvert material: | Metal |
| Culvert perch (cm): | 15 each |
| Substrate (y/n): | Y |
| Photos (y/n): | Y |
| Comments: | Low water flow |



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Big Run, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from the boundary of forest service land and private property about 40 meters downstream of trail number 432. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Reddish Knob

Photos taken on Big Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-------------------|
| RIFFLE | 6 | 148.7 | |
| RIFFLE | 16 | 855 | |
| RIFFLE | 26 | 1626.1 | LEAF PACK ON LEFT |
| CULVERT | | 1966.8 | |
| RIFFLE | 36 | 2134.5 | |
| RIFFLE | 46 | 3046.2 | |
| RIFFLE | 56 | 3797.9 | |
| RIFFLE | 66 | 4576.7 | |

| | |
|-------------------------------|--|
| Stream: | North Fork Little River |
| District: | Dry River |
| USGS Quadrangle: | Reddish Knob |
| Survey Date: | 06/21/04 |
| Downstream Starting Point: | confluence of North and South Fork of Little River |
| Total Distance Surveyed (km): | 7.2 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 31 | 69 |
| Total Area (m ²): | 2638±775 | 5940±1208 |
| Correction Factor Applied: | 1.15 | 0.90 |
| Number of Paired Samples: | 13 | 13 |
| Total Count: | 140 | 129 |
| Number per km: | 19 | 18 |
| Mean Area (m ²): | 19 | 46 |
| Mean Maximum Depth (cm): | 28 | 15 |
| Mean Average Depth (cm): | 16 | 7 |
| Mean Residual Depth (cm): | 9 | -- |
| Percent Surveyed as Glides: | 26 | -- |
| Percent Surveyed as Runs: | -- | 1 |
| Percent Surveyed as Cascades: | -- | 16 |
| Percent with >35% Fines: | 9 | 0 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 29 |
| < 5 m long, > 55 cm diameter: | 1 |
| > 5 m long, 10 cm – 55 cm diameter: | 14 |
| > 5 m long, > 55 cm diameter: | 3 |
| Total: | 47 |

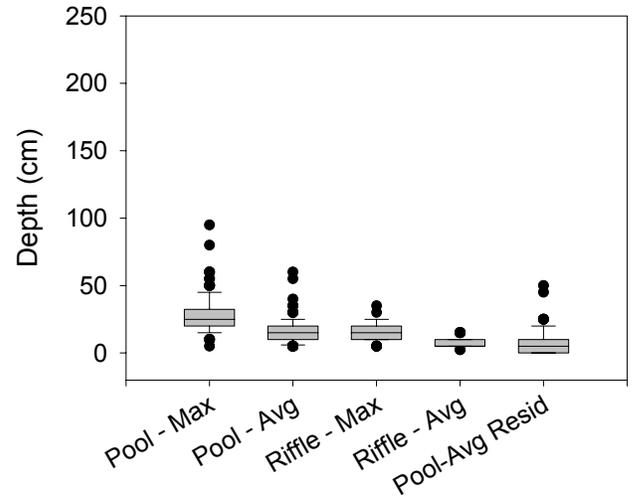
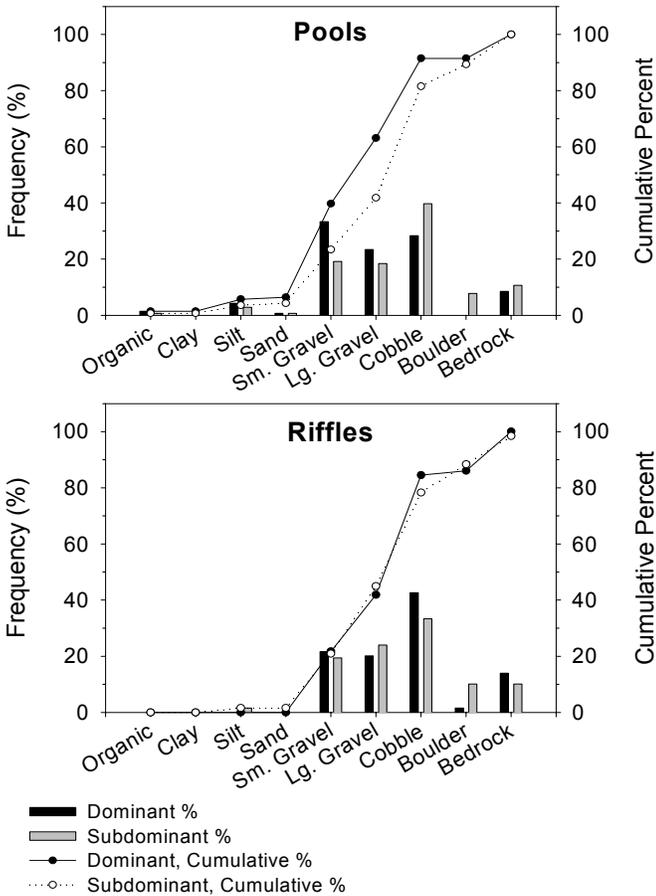
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 11 | 3 |
| Maximum | 27 | 20 |
| 75 th Percentile | 10 | 2 |
| 25 th Percentile | 6 | 1 |
| Minimum | 5 | 0 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

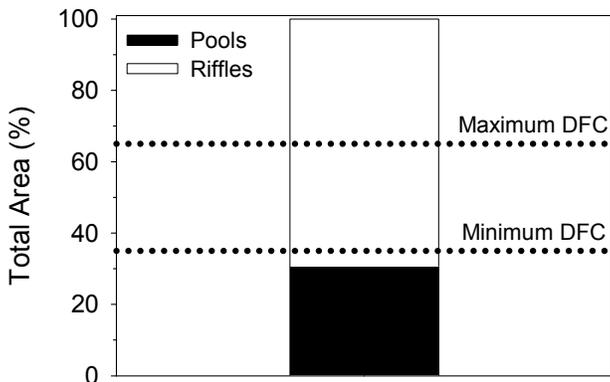
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 73 |
| B: | 0 |
| C: | 27 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 5 |
| Mean Channel Gradient (%): | 6 |
| Median Water Temperature (C): | 11 |

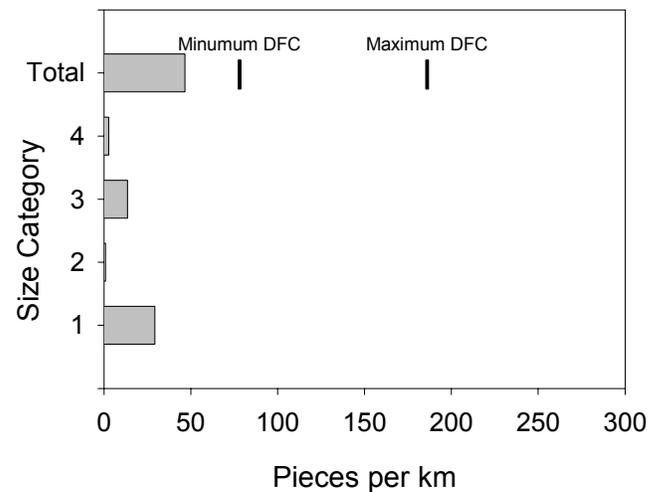


Maximum and average depths and residual pool depths for pools and riffles in North Fork Little River, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in North Fork Little River, summer 2004.



Estimated area of North Fork Little River in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in North Fork Little River, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Reddish Knob

Stream features found on North Fork Little River during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|--|
| SIDE CHANNEL | 60.9 | | IN ON LEFT |
| SIDE CHANNEL | 83.9 | | OUT ON LEFT |
| UNDERGROUND | 494 | | 464.5 STRING RUNS OUT - END SURVEY FOR 6/21/04 21:00 |
| TRIBUTARY | 585 | | IN ON LEFT |
| TRIBUTARY | 990.5 | | IN ON LEFT |
| UNDERGROUND | 990.5 | | AT 784.7 FORK IN STREAM BED FOLLOWED UP RIGHT SIDE. 904.8 FORK BEGINS. |
| SIDE CHANNEL | 1056 | | IN ON RIGHT |
| SIDE CHANNEL | 1078.5 | | OUT ON RIGHT |
| SEEP | 1235.1 | | ON RIGHT SIDE OF CHANNEL |
| SIDE CHANNEL | 1508.8 | | IN ON RIGHT |
| SIDE CHANNEL | 1521.5 | | OUT ON RIGHT |
| BRAID | 1538 | | |
| SIDE CHANNEL | 1583.3 | | IN ON LEFT |
| LAND SLIDE | 1583.3 | | STARTS AT 1542.1, COLLAPSED UNDERCUT BANK |
| SEEP | 1675 | | RIGHT |
| SIDE CHANNEL | 1759.5 | | IN ON LEFT |
| SIDE CHANNEL | 1836.8 | | NO VISIBLE FLOW, UNDERGROUND |
| TRIBUTARY | 1842 | | IN ON LEFT |
| UNDERGROUND | 2127.7 | | OLD DRY TRIB AT SAME DISTANCE |
| SIDE CHANNEL | 2575 | | LEFT, BIG SLIDE ON LEFT BANK OF SCH |
| TRIBUTARY | 2841.6 | | RIGHT' 3M DEEP HOLE IN STREAM DRY |
| TRIBUTARY | 2965 | | LEFT |
| UNDERGROUND | 2974.5 | | |
| SEEP | 3088.9 | | RIGHT |
| UNDERGROUND | 3105 | | |
| SIDE CHANNEL | 3124.5 | | IN ON RIGHT |
| SEEP | 3141.2 | | RIGHT |
| SIDE CHANNEL | 3340.7 | | OUT ON RIGHT |
| TRIBUTARY | 3960.8 | | DRY |
| UNDERGROUND | 3960.8 | | |
| SEEP | 4185 | | LEFT |
| UNDERGROUND | 4447.5 | | |
| UNDERGROUND | 4503.5 | | |
| UNDERGROUND | 4725 | | |
| FALL | 4765 | | |
| TRIBUTARY | 4852.3 | | IN ON RIGHT |
| UNDERGROUND | 4903.9 | | PROOF OF CAMPING |
| UNDERGROUND | 4932 | | |
| UNDERGROUND | 5041 | | |
| UNDERGROUND | 5130.2 | | |
| SIDE CHANNEL | 5136 | | LEFT |
| TRIBUTARY | 5172.6 | | RIGHT, WET, NO FLOW |
| UNDERGROUND | 5215.6 | | |
| UNDERGROUND | 5511.3 | | |
| TRIBUTARY | 5514 | | LEFT |
| UNDERGROUND | 5554.1 | | |

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|---|
| SEEP | 5595.8 | | LEFT |
| FALL | 5763 | | |
| FALL | 5850.1 | | |
| FALL | 5944.9 | | 3 M HIGH |
| FALL | 5948.9 | | 2.5 M HIGH |
| FALL | 6100.9 | | 3.5M |
| FALL | 6114.3 | | 1.5M |
| FALL | 6223.5 | | 1M |
| SIDE CHANNEL | 6245.6 | | LEFT |
| UNDERGROUND | 6262 | | |
| SEEP | 6278.5 | | LEFT |
| TRIBUTARY | 6356.2 | | LEFT |
| UNDERGROUND | 6408.5 | | |
| FALL | 6444.4 | | 1M |
| UNDERGROUND | 6453.6 | | |
| FALL | 6585.9 | | 1M |
| SEEP | 6787 | | RIGHT |
| UNDERGROUND | 6798.4 | | |
| FALL | 6839.7 | | 1.5M |
| SEEP | 6895.8 | | RIGHT |
| UNDERGROUND | 6909 | | |
| UNDERGROUND | 6916.9 | | |
| UNDERGROUND | 6936.1 | | |
| UNDERGROUND | 6942.3 | | |
| UNDERGROUND | 6974.9 | | |
| UNDERGROUND | 7007.4 | | |
| SEEP | 7009.1 | | RIGHT |
| UNDERGROUND | 7014.5 | | |
| UNDERGROUND | 7057 | | |
| UNDERGROUND | 7061.5 | | |
| UNDERGROUND | 7064.3 | | |
| UNDERGROUND | 7210 | | |
| UNDERGROUND | 7227.5 | | END SURVEY 6/23/04 15:15, NO MORE STREAM CHANNEL |
| BREAK | | | NATURAL BREAK |
| BREAK | | | NATURAL BREAK |
| BREAK | | | NATURAL BREAK |
| LAND SLIDE | | | RIGHT BANK |

Reddish Knob

Stream crossings encountered on North Fork Little River during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

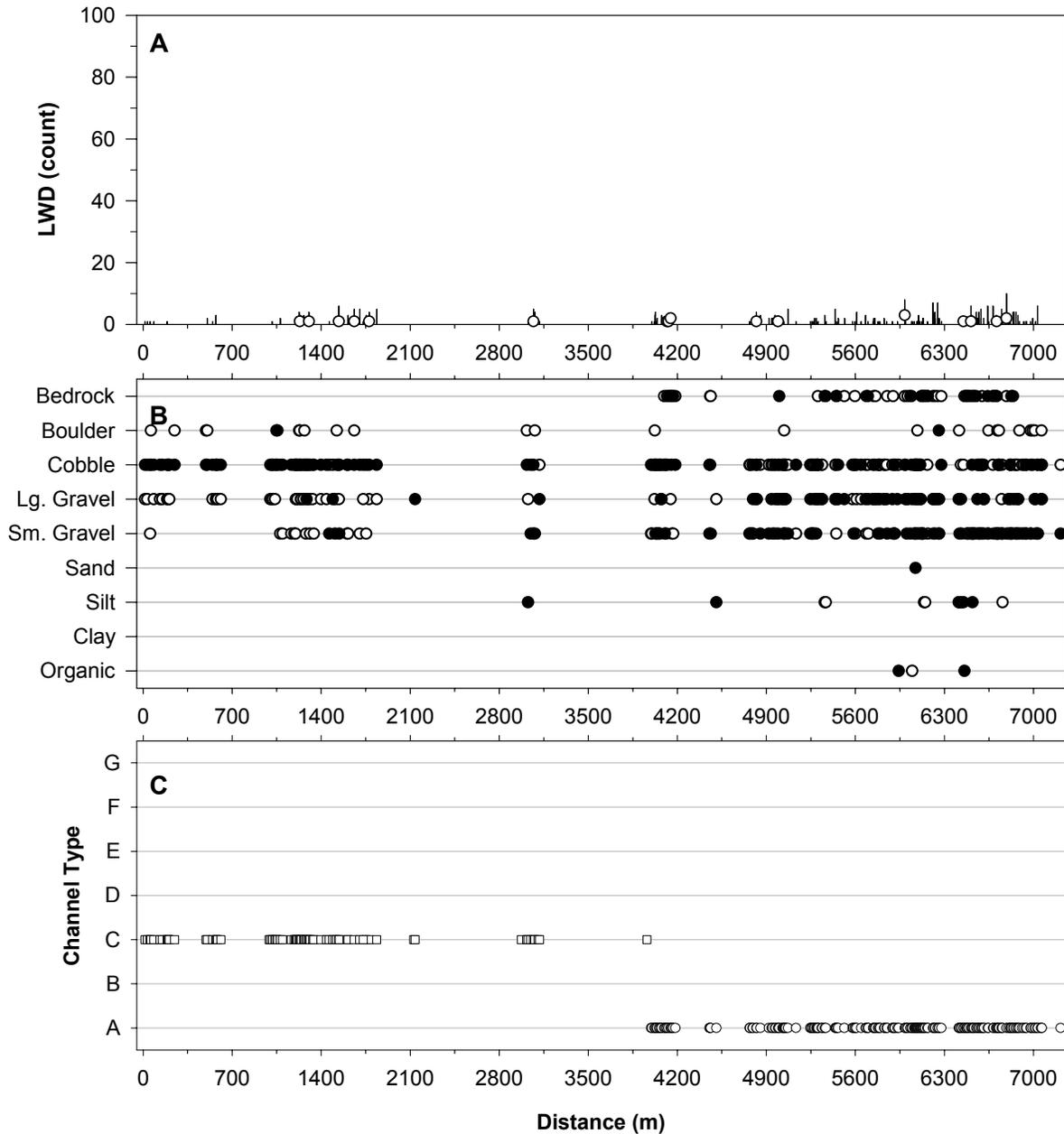
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

Comments:



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in North Fork Little River, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from confluence of North and South Fork of Little River. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Reddish Knob

Photos taken on North Fork Little River during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|---------------------------------------|
| RIFFLE | 10 | 1013.5 | |
| RIFFLE | 20 | 1296.4 | |
| GLIDE | 30 | 1703.2 | |
| RIFFLE | 30 | 1836.8 | |
| RUN | 40 | 4129.8 | SMALL FISH PRESENT |
| POOL | 50 | 4507.5 | |
| RIFFLE | 50 | 4939.9 | ROCK WALL ON RIGHT 20M FROM STREAM |
| POOL | 60 | 5039.6 | SIDE POOL ON LEFT |
| RIFFLE | 59 | 5273.5 | |
| CASCADE | 69 | 5608.9 | |
| RIFFLE | 79 | 5890.9 | |
| POOL | 90 | 6010.4 | BEDROCK WALLS ON BOTH SIDES |
| RIFFLE | 89 | 6096 | |
| POOL | 100 | 6123.6 | |
| RIFFLE | 98 | 6275.4 | |
| GLIDE | 111 | 6448.6 | NO WADING ROD IN PHOTO |
| RIFFLE | 108 | 6558.9 | |
| POOL | 121 | 6709.9 | |
| RIFFLE | 119 | 6728.7 | |
| POOL | 131 | 6910.5 | |
| RIFFLE | 129 | 6977.4 | |
| POOL | 140 | 7065.9 | |

| | |
|-------------------------------|--|
| Stream: | South Fork Little River |
| District: | Dry River |
| USGS Quadrangle: | Reddish Knob |
| Survey Date: | 06/22/04 |
| Downstream Starting Point: | 4252618N, 657604E; confluence of North Fork Little River |
| Total Distance Surveyed (km): | 2.7 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 31 | 69 |
| Total Area (m ²): | 907±983 | 2067±952 |
| Correction Factor Applied: | 1.10 | 1.51 |
| Number of Paired Samples: | 2 | 2 |
| Total Count: | 20 | 18 |
| Number per km: | 7 | 7 |
| Mean Area (m ²): | 45 | 115 |
| Mean Maximum Depth (cm): | 28 | 11 |
| Mean Average Depth (cm): | 18 | 5 |
| Mean Residual Depth (cm): | 11 | -- |
| Percent Surveyed as Glides: | 10 | -- |
| Percent Surveyed as Runs: | -- | 6 |
| Percent Surveyed as Cascades: | -- | 0 |
| Percent with >35% Fines: | 60 | 22 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 13 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 12 |
| > 5 m long, > 55 cm diameter: | 0 |
| Total: | 25 |

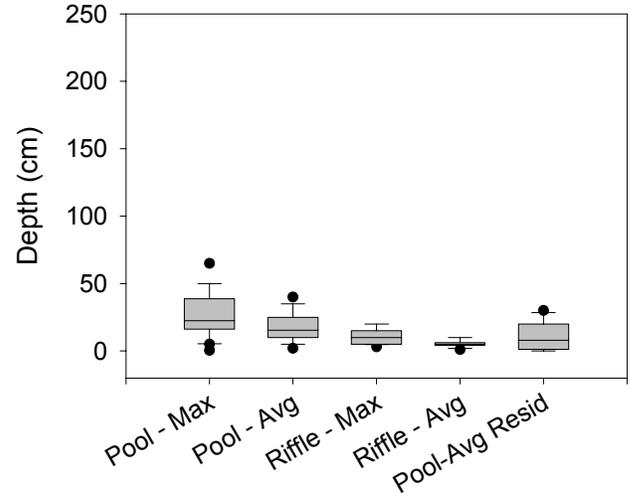
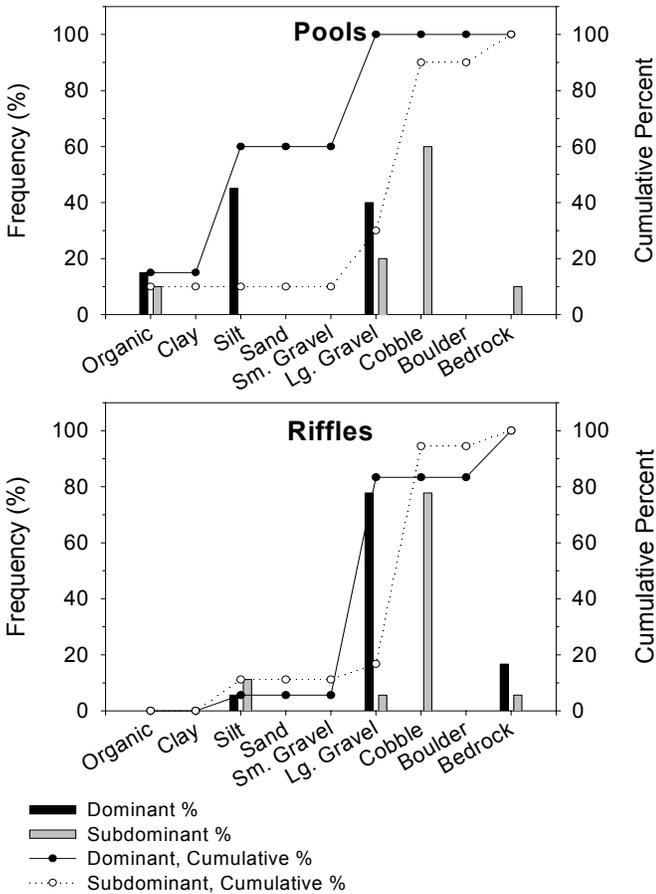
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 57 | 18 |
| Maximum | 93 | 33 |
| 75 th Percentile | 75 | 29 |
| 25 th Percentile | 39 | 8 |
| Minimum | 21 | 2 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

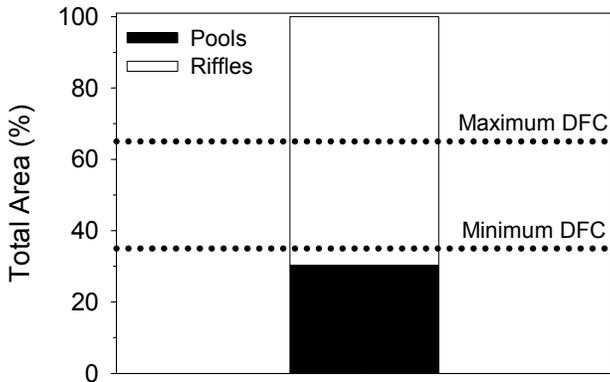
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 0 |
| B: | 78 |
| C: | 22 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|------|
| Mean Bankfull Channel Width (m): | 21 |
| Mean Channel Gradient (%): | 3 |
| Median Water Temperature (C): | 11.5 |

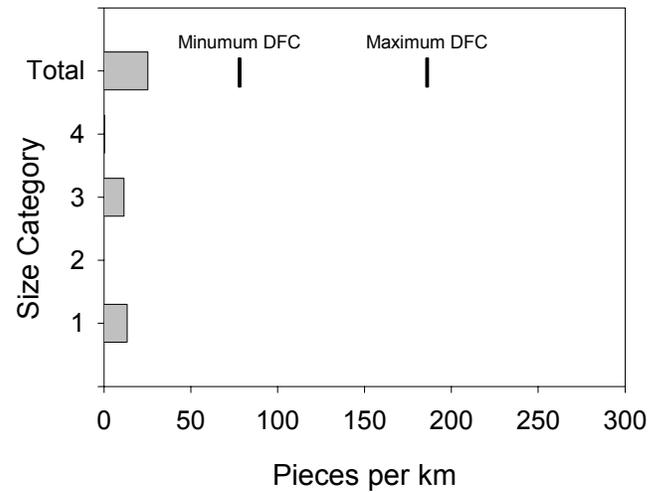


Maximum and average depths and residual pool depths for pools and riffles in South Fork Little River, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in South Fork Little River, summer 2004.



Estimated area of South Fork Little River in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in South Fork Little River, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Reddish Knob

Stream features found on South Fork Little River during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|--|
| UNDERGROUND | 102.1 | | |
| UNDERGROUND | 155.3 | | |
| SIDE CHANNEL | 200.7 | | IN ON LEFT |
| SIDE CHANNEL | 228 | | OUT ON LEFT |
| UNDERGROUND | 550 | | STREAM CHANNEL DISTORTED DUE TO FLOODS |
| SIDE CHANNEL | 644.2 | | IN ON RIGHT |
| SIDE CHANNEL | 689.9 | | OUT ON RIGHT |
| UNDERGROUND | 780.7 | | |
| TRIBUTARY | 831.4 | 0.5 | IN ON RIGHT |
| FORD | 840.1 | | TRAIL CROSSING |
| UNDERGROUND | 858.1 | | |
| UNDERGROUND | 1232.5 | | |
| SIDE CHANNEL | 1255 | | IN ON RIGHT |
| UNDERGROUND | 2694 | | END SURVEY AT 12:00. STREAM DRY FOR 1420M, WITH NO SIGNS OF WATER RETURNING ABOVE GROUND |

Reddish Knob

Stream crossings encountered on South Fork Little River during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

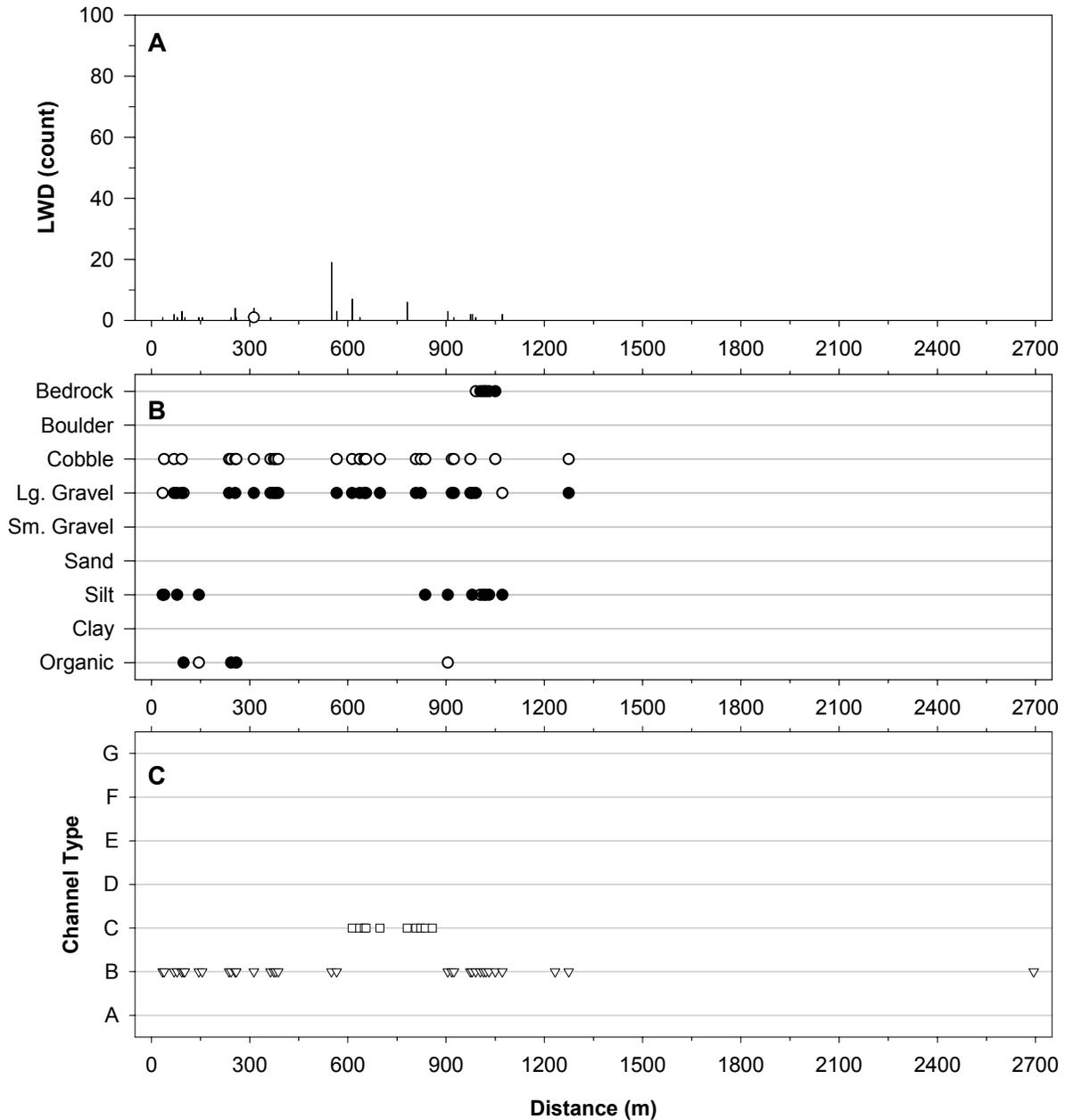
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

Comments:



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in South Fork Little River, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from confluence with North Fork Little River. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Reddish Knob

Photos taken on South Fork Little River during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-----------------|
| RIFFLE | 8 | 613 | |
| RIFFLE | 18 | 1274 | |

| Stream: | Wolf Run |
|-------------------------------|--|
| District: | Dry River |
| USGS Quadrangle: | Reddish Knob |
| Survey Date: | 06/30/04 |
| Downstream Starting Point: | 4255488N, 663366E; property boundary on Wolf Run |
| Total Distance Surveyed (km): | 3.0 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 11 | 89 |
| Total Area (m ²): | 821±147 | 6504±634 |
| Correction Factor Applied: | 0.97 | 1.12 |
| Number of Paired Samples: | 7 | 6 |
| Total Count: | 67 | 68 |
| Number per km: | 22 | 22 |
| Mean Area (m ²): | 12 | 96 |
| Mean Maximum Depth (cm): | 38 | 25 |
| Mean Average Depth (cm): | 21 | 12 |
| Mean Residual Depth (cm): | 14 | -- |
| Percent Surveyed as Glides: | 24 | -- |
| Percent Surveyed as Runs: | -- | 1 |
| Percent Surveyed as Cascades: | -- | 0 |
| Percent with >35% Fines: | 28 | 10 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 15 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 24 |
| > 5 m long, > 55 cm diameter: | 11 |
| Total: | 51 |

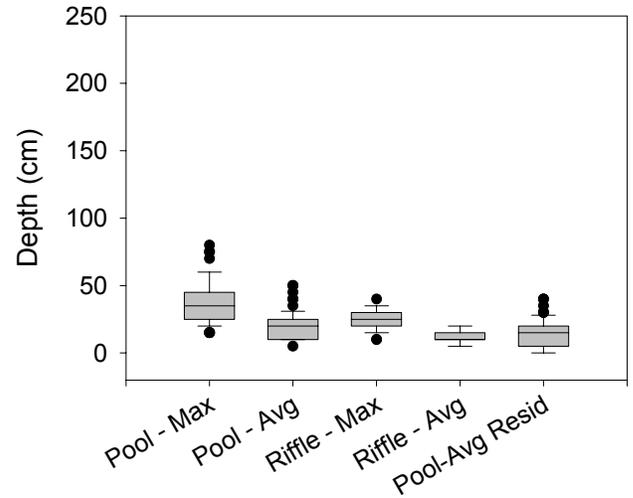
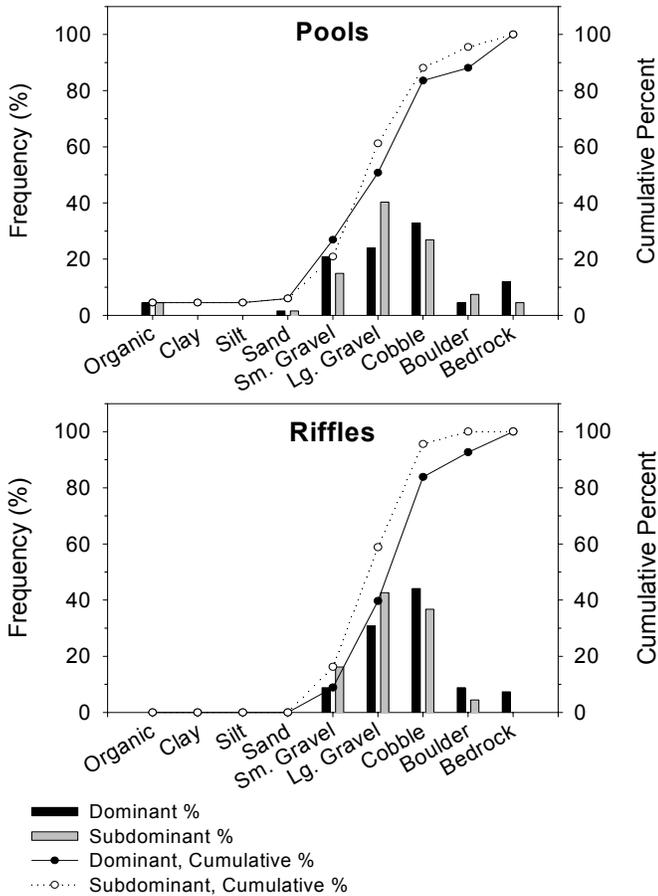
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 7 | 1 |
| Maximum | 10 | 3 |
| 75 th Percentile | 9 | 1 |
| 25 th Percentile | 5 | 1 |
| Minimum | 5 | 0 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

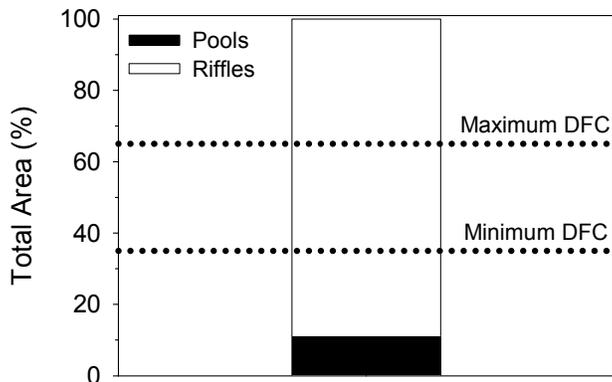
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 0 |
| B: | 100 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 5 |
| Mean Channel Gradient (%): | 3 |
| Median Water Temperature (C): | 14 |

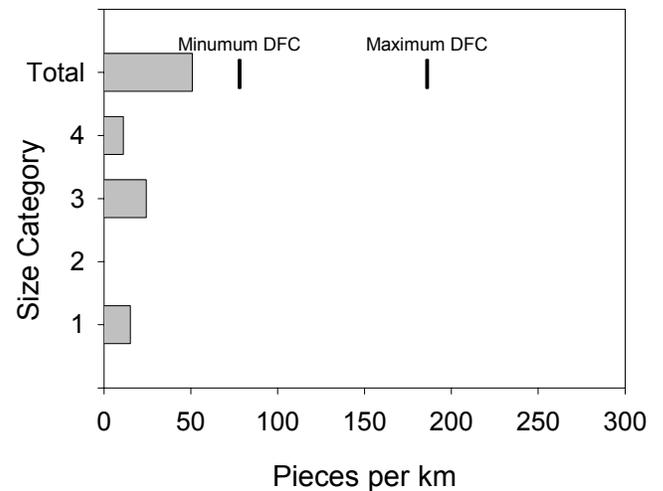


Maximum and average depths and residual pool depths for pools and riffles in Wolf Run, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Wolf Run, summer 2004.



Estimated area of Wolf Run in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Wolf Run, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Reddish Knob

Stream features found on Wolf Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|--|
| TRIBUTARY | 51.9 | | DRY. IN ON RIGHT |
| SIDE CHANNEL | 159.4 | | IN ON RIGHT. DRY. |
| TRIBUTARY | 165.9 | 0.75 | IN ON LEFT |
| SIDE CHANNEL | 171.3 | | OUT ON RIGHT |
| TRIBUTARY | 175.4 | 0.5 | IN ON LEFT |
| TRIBUTARY | 212.2 | | DRY. IN ON RIGHT |
| SIDE CHANNEL | 237.4 | | IN ON RIGHT. |
| SEEP | 261.1 | | |
| UNDERGROUND | 305.8 | | |
| SIDE CHANNEL | 325.6 | | OUT ON LEFT |
| FORD | 685.8 | | TRAIL CROSSING, TRAIL ON MAP |
| TRIBUTARY | 882.5 | 1 | IN ON RIGHT |
| TRIBUTARY | 966 | 0.5 | IN ON RIGHT |
| SIDE CHANNEL | 1029.4 | | IN ON RIGHT |
| SIDE CHANNEL | 1051.8 | | OUT ON LEFT |
| SIDE CHANNEL | 1248.9 | | IN ON LEFT |
| TRIBUTARY | 1657 | 0.5 | IN ON LEFT |
| TRIBUTARY | 1719 | 1 | IN ON RIGHT |
| UNDERGROUND | 1774 | | |
| TRIBUTARY | 1904.4 | | IN ON LEFT. DRY. |
| SIDE CHANNEL | 2224.9 | | IN ON LEFT |
| SIDE CHANNEL | 2335.6 | | IN ON RIGHT |
| SIDE CHANNEL | 2599 | | IN ON LEFT |
| SIDE CHANNEL | 2614.4 | | OUT ON LEFT |
| TRIBUTARY | 3001.9 | 0.5 | IN ON RIGHT |
| BRAID | 3038.4 | | END SURVEY AT 16:30, 6/30/04. CHANNEL BECOMES DRY AND SPLITS INTO NUMEROUS SMALLER DRY CHANNELS. |

Reddish Knob

Stream crossings encountered on Wolf Run during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

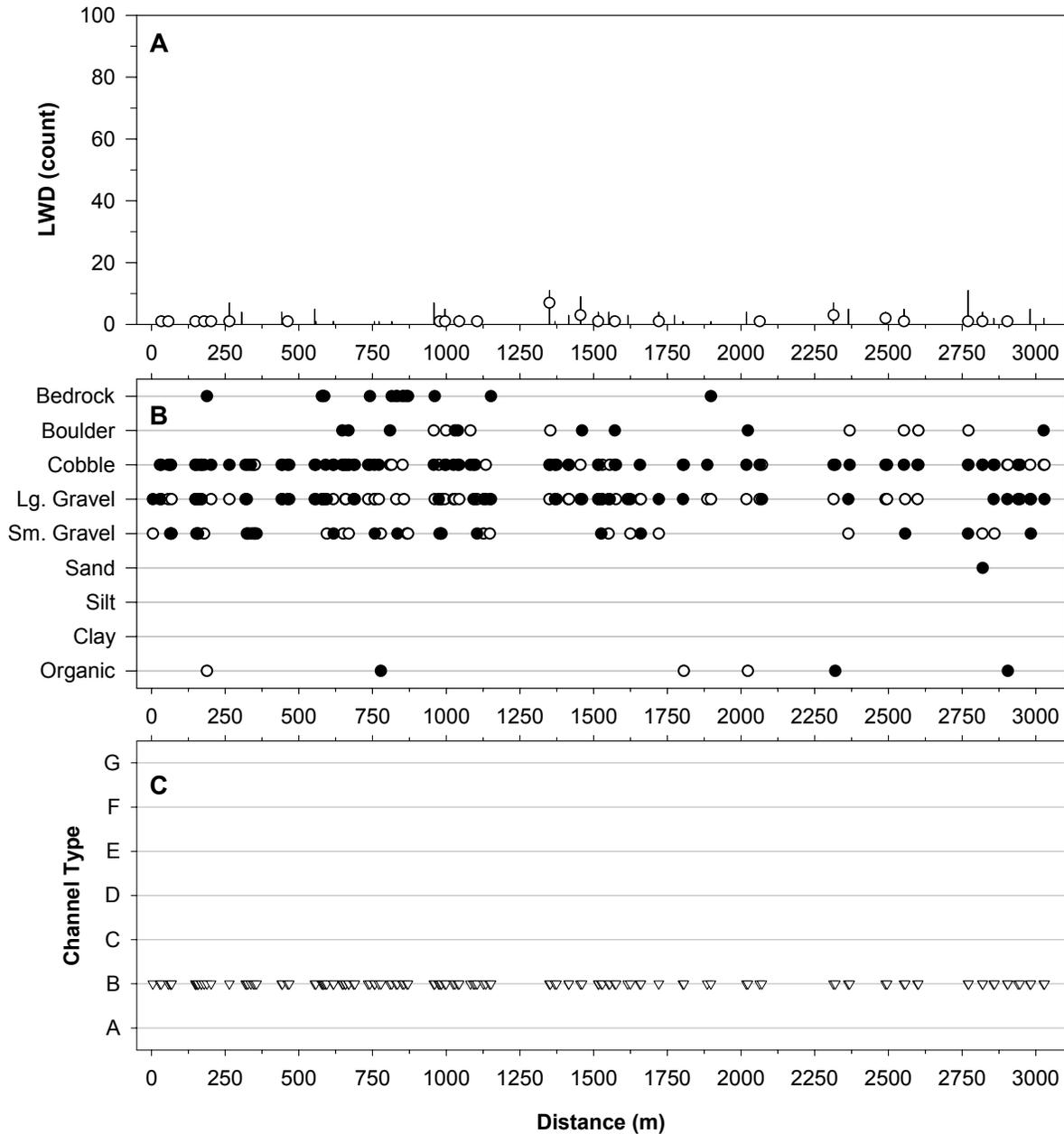
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

Comments:

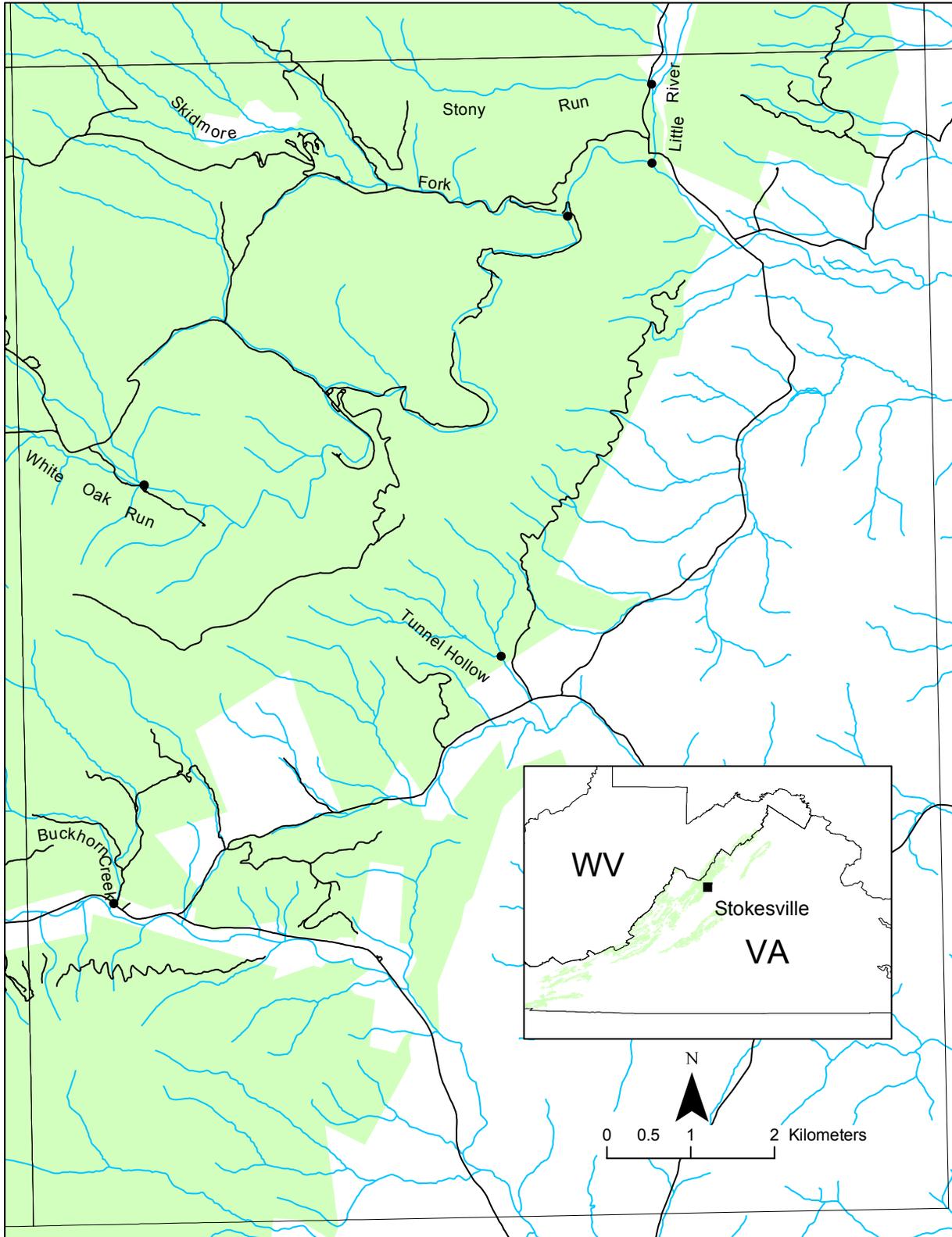


Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Wolf Run, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from Wolf Run. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Reddish Knob

Photos taken on Wolf Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-----------------|
| RIFFLE | 8 | 178.5 | |
| RUN | 18 | 583.1 | |
| RIFFLE | 29 | 830 | |
| RIFFLE | 38 | 1081.9 | |
| RIFFLE | 48 | 1551.1 | |
| RIFFLE | 58 | 2364 | |
| POOL | 69 | 3029.2 | |



Streams inventoried on the Stokesville Quadrangle using BVET habitat surveys during summer 2004.

| | |
|-------------------------------|-------------------------|
| Stream: | Buckhorn Creek |
| District: | Dry River |
| USGS Quadrangle: | Stokesville |
| Survey Date: | 06/23/04 |
| Downstream Starting Point: | at bridge, north of 250 |
| Total Distance Surveyed (km): | 3.3 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 39 | 61 |
| Total Area (m ²): | 3735±367 | 5792±737 |
| Correction Factor Applied: | 1.00 | 1.00 |
| Number of Paired Samples: | 15 | 13 |
| Total Count: | 132 | 118 |
| Number per km: | 40 | 36 |
| Mean Area (m ²): | 28 | 49 |
| Mean Maximum Depth (cm): | 32 | 17 |
| Mean Average Depth (cm): | 18 | 9 |
| Mean Residual Depth (cm): | 9 | -- |
| Percent Surveyed as Glides: | 18 | -- |
| Percent Surveyed as Runs: | -- | 0 |
| Percent Surveyed as Cascades: | -- | 0 |
| Percent with >35% Fines: | 28 | 8 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 43 |
| < 5 m long, > 55 cm diameter: | 1 |
| > 5 m long, 10 cm – 55 cm diameter: | 30 |
| > 5 m long, > 55 cm diameter: | 5 |
| Total: | 79 |

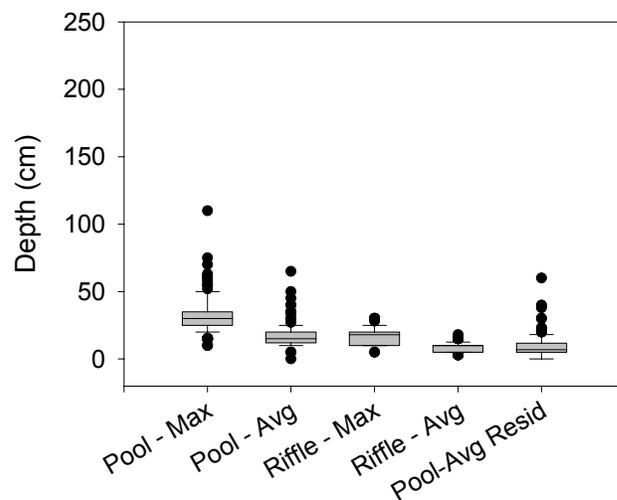
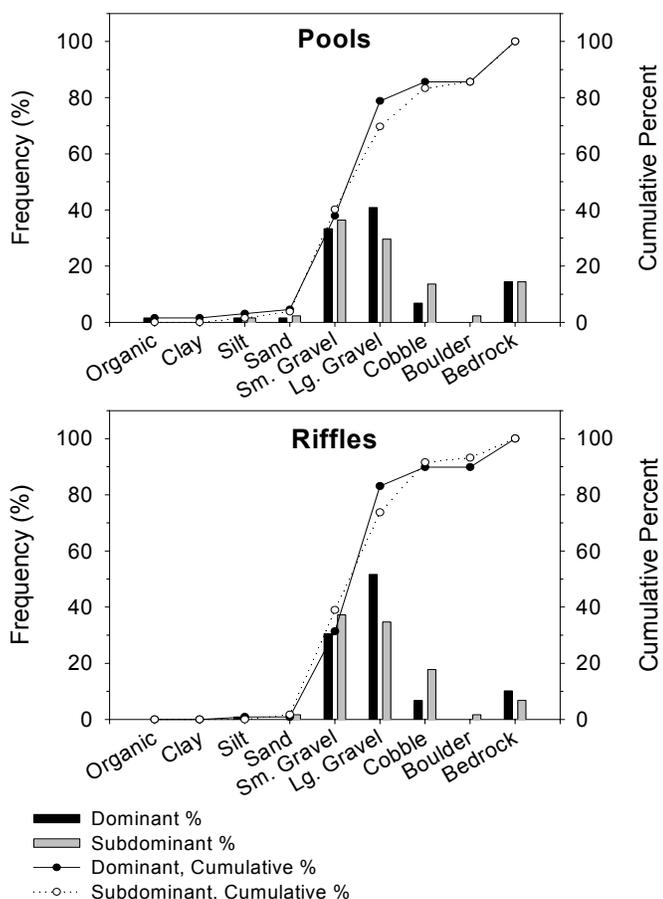
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 9 | 1 |
| Maximum | 26 | 18 |
| 75 th Percentile | 9 | 1 |
| 25 th Percentile | 6 | 0 |
| Minimum | 3 | 0 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

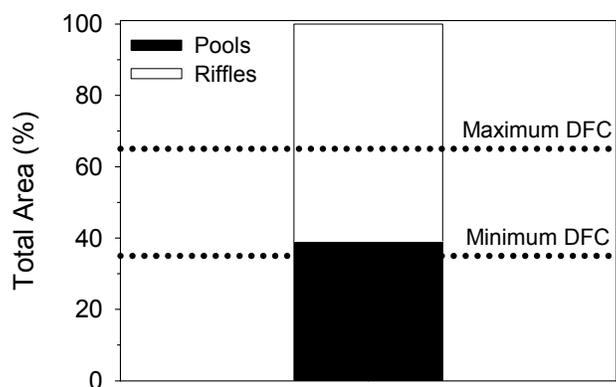
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 8 |
| B: | 0 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 92 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 6 |
| Mean Channel Gradient (%): | 4 |
| Median Water Temperature (C): | 18 |

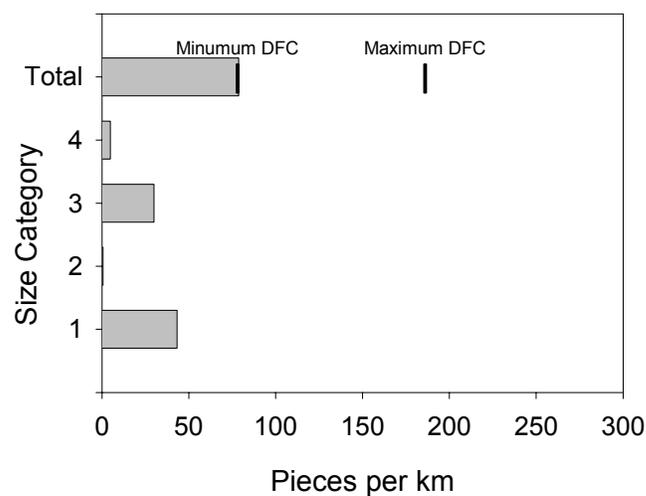


Maximum and average depths and residual pool depths for pools and riffles in Buckhorn Creek, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Buckhorn Creek, summer 2004.



Estimated area of Buckhorn Creek in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Buckhorn Creek, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

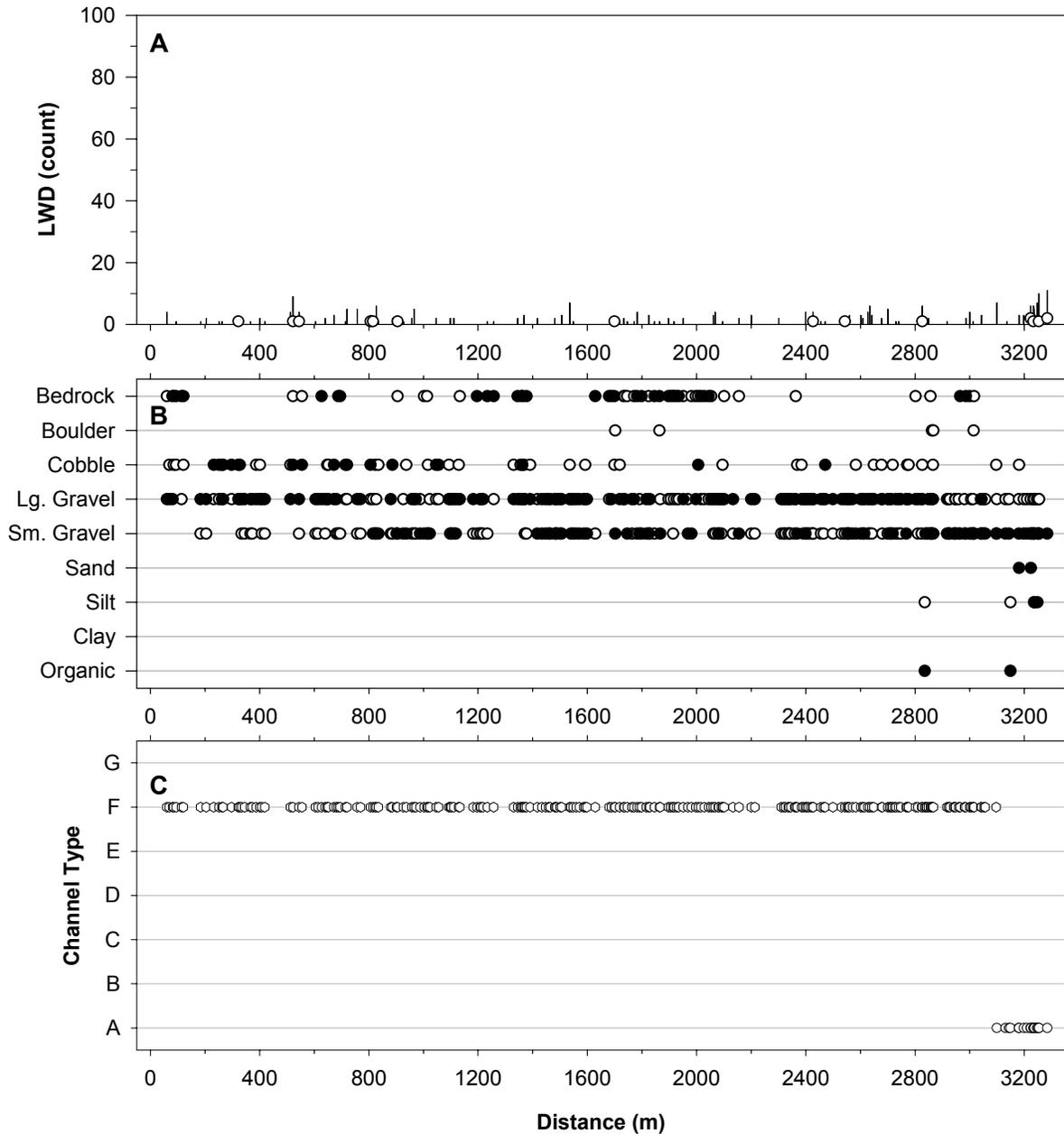
- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Buckhorn Creek during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|--|
| SIDE CHANNEL | 122 | | IN ON LEFT |
| TRIBUTARY | 286 | 1 | |
| SIDE CHANNEL | 309 | | OUT LEFT |
| UNDERGROUND | 309 | | FROM 297 m TO 309 m |
| TRIBUTARY | 556 | | IN ON RIGHT |
| TRIBUTARY | 1041 | | |
| FORD | 1118 | | CLOSED TO USE |
| SEEP | 1325 | 0.5 | |
| UNDERGROUND | 1386 | | FROM 1377 m TO 1386 m |
| TRIBUTARY | 1453 | | |
| SIDE CHANNEL | 1471 | | IN ON LEFT, DRY |
| SIDE CHANNEL | 1496 | | OUT ON LEFT |
| FORD | 1905 | | ROAD CROSSING |
| SEEP | 2038 | | IN ON LEFT |
| SEEP | 2080 | | IN ON RIGHT |
| SEEP | 2123 | | IN ON LEFT |
| UNDERGROUND | 2203 | | FROM 2200 m TO 2203 m |
| UNDERGROUND | 2301 | | FROM 2213 m TO 2301 m |
| UNDERGROUND | 2316 | | FROM 2310 m TO 2316 m |
| FORD | 2404 | | VERY OLD ROAD CROSSING |
| UNDERGROUND | 2520 | | FROM 2471 m TO 2520 m |
| TRIBUTARY | 2532 | | IN ON LEFT |
| UNDERGROUND | 2646 | | FROM 2642 m TO 2646 m |
| UNDERGROUND | 2653 | | FROM 1649 m TO 2653 m |
| FORD | 2656 | | VERY OLD ROAD CROSSING |
| SIDE CHANNEL | 2780 | | IN ON RIGHT |
| SIDE CHANNEL | 2801 | | OUT ON RIGHT |
| TRIBUTARY | 2811 | | IN ON RIGHT |
| TRIBUTARY | 2880 | | DRY, IN ON RIGHT |
| TRIBUTARY | 3054 | | DRY, IN ON RIHT |
| UNDERGROUND | 3136 | | FROM 3131 m TO 3136 m |
| UNDERGROUND | 3200 | | FROM 3198 m TO 3200 m |
| TRIBUTARY | 3209 | | DRY, IN ON LEFT |
| UNDERGROUND | 3211 | | FROM 3210 m TO 3211 m |
| UNDERGROUND | 3235 | | FROM 3234 m TO 3235 m |
| UNDERGROUND | 3305 | | FROM 3284 m TO 3305 m ; RECENT CLEAR CUT, ~15-20 YEARS |

Stream crossings encountered on Buckhorn Creek during BVET habitat inventory, summer 2004.
Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

| | |
|-------------------------|---------------|
| Crossing type: | Ford |
| Distance (m): | 1118 |
| Road number/trail name: | 433 |
| Culvert type: | |
| Culvert outlets (n): | |
| Culvert diameter (cm): | |
| Culvert height (cm): | |
| Culvert material: | |
| Culvert perch (cm): | |
| Substrate (y/n): | Y |
| Photos (y/n): | N |
| Comments: | Closed to use |



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Buckhorn Creek, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from bridge, north of 250. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Buckhorn Creek during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-----------------|
| RIFFLE | 10 | 387 | |
| RIFFLE | 15 | 627 | |
| RIFFLE | 20 | 757 | |
| RIFFLE | 25 | 957 | |
| RIFFLE | 35 | 1218 | |
| RIFFLE | 45 | 1587 | |
| RIFFLE | 55 | 1864 | |
| RIFFLE | 65 | 2095 | |
| RIFFLE | 75 | 2427 | |
| RIFFLE | 85 | 2713 | |
| RIFFLE | 95 | 2917 | |
| RIFFLE | 105 | 3131 | |

| | |
|-------------------------------|--|
| Stream: | Little River |
| District: | Dry River |
| USGS Quadrangle: | Stokesville and Reddish Knob |
| Survey Date: | 06/17/04 |
| Downstream Starting Point: | 660539E 4247514N: confluence of Little River |
| Total Distance Surveyed (km): | 0.9 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 20 | 80 |
| Total Area (m ²): | 1456 | 5720 |
| Correction Factor Applied: | 0.94 | 1.08 |
| Number of Paired Samples: | 1 | 2 |
| Total Count: | 10 | 19 |
| Number per km: | 11 | 21 |
| Mean Area (m ²): | 146 | 301 |
| Mean Maximum Depth (cm): | 84 | 33 |
| Mean Average Depth (cm): | 58 | 22 |
| Mean Residual Depth (cm): | 16 | -- |
| Percent Surveyed as Glides: | 10 | -- |
| Percent Surveyed as Runs: | -- | 32 |
| Percent Surveyed as Cascades: | -- | 0 |
| Percent with >35% Fines: | 0 | 0 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 4 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 4 |
| > 5 m long, > 55 cm diameter: | 0 |
| Total: | 9 |

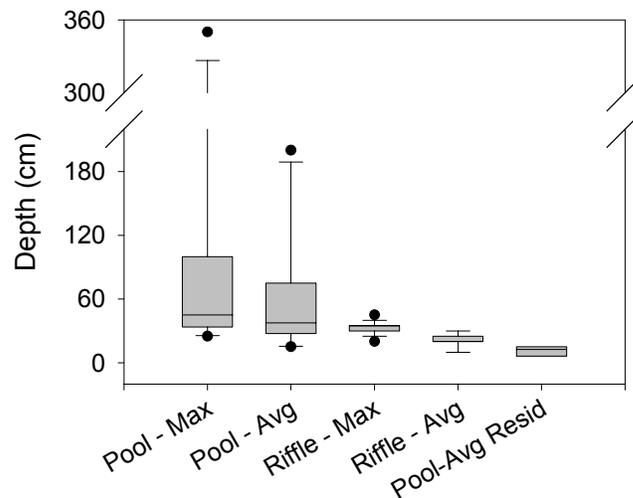
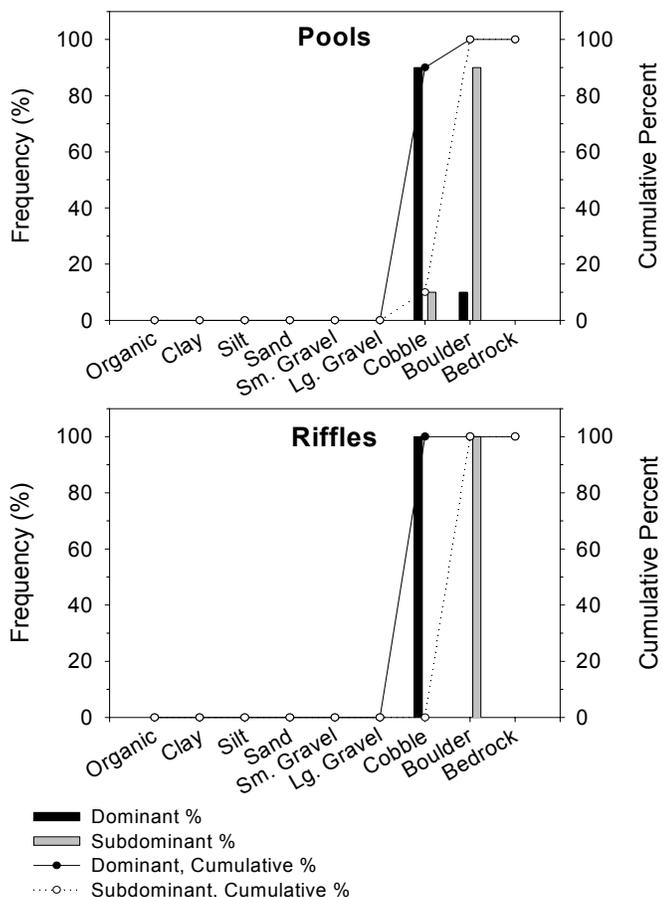
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 34 | 8 |
| Maximum | 40 | 26 |
| 75 th Percentile | 37 | 9 |
| 25 th Percentile | 31 | 2 |
| Minimum | 28 | 2 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

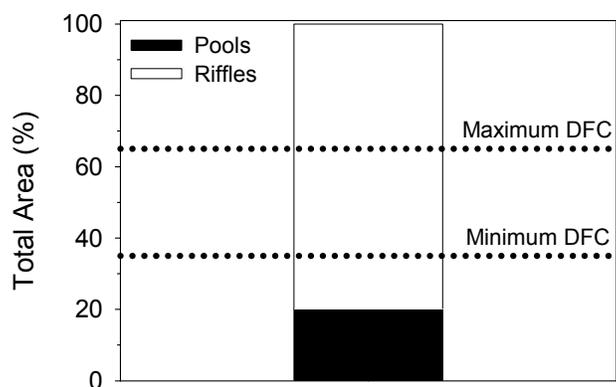
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 0 |
| B: | 100 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 17 |
| Mean Channel Gradient (%): | 2 |
| Median Water Temperature (C): | 17 |

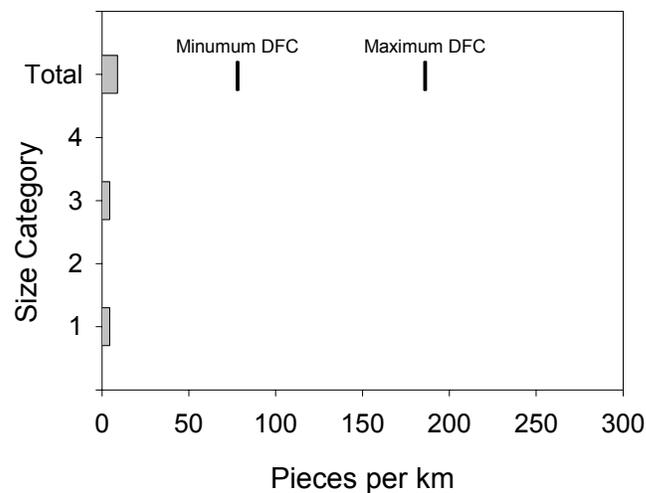


Maximum and average depths and residual pool depths for pools and riffles in Little River, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Little River, summer 2004.



Estimated area of Little River in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Little River, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stokesville

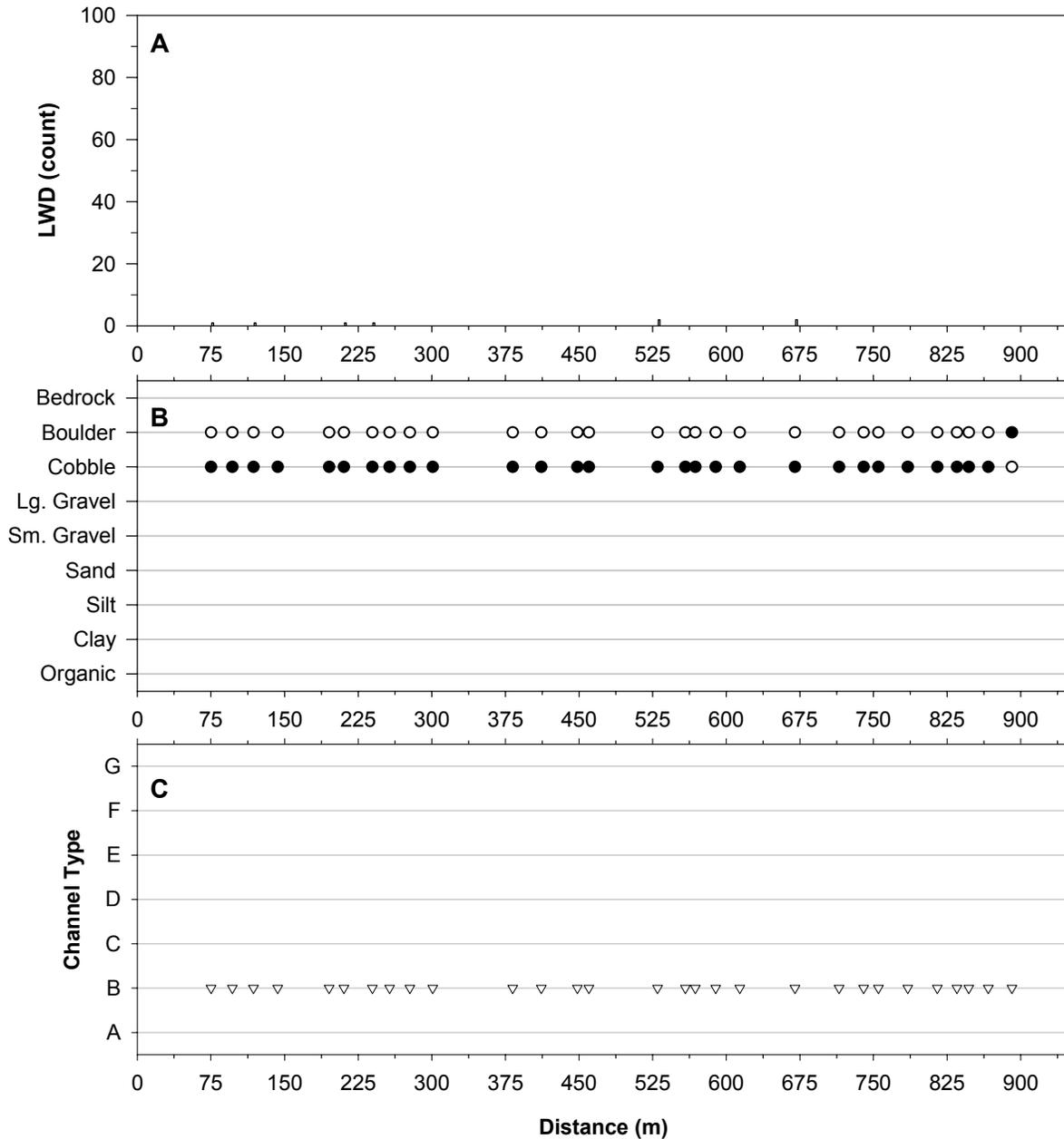
Stream features found on Little River during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|--|
| BRIDGE | 718 | | CONCRETE BRIDGE, Photo taken week of 6/21/04, forgot during survey |
| SIDE CHANNEL | 785 | | |
| SIDE CHANNEL | 815 | | |
| SIDE CHANNEL | 835 | | |
| SIDE CHANNEL | 853 | | |

Stokesville

Stream crossings encountered on Little River during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

| | |
|-------------------------|--------|
| Crossing type: | Bridge |
| Distance (m): | 140 |
| Road number/trail name: | 718 |
| Culvert type: | |
| Culvert outlets (n): | |
| Culvert diameter (cm): | |
| Culvert height (cm): | |
| Culvert material: | |
| Culvert perch (cm): | |
| Substrate (y/n): | Y |
| Photos (y/n): | N |
| Comments: | |



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Little River, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from confluence of Little River. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Stokesville

Photos taken on Little River during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|--------------------------------------|
| RIFFLE | 6 | 277.6 | |
| BRIDGE | 140 | 718 | |
| RIFFLE | 16 | 755 | REACHED PRIVATE PROPERTY BOUNDARY |

| Stream: | Skidmore Fork |
|-------------------------------|---|
| District: | Dry River |
| USGS Quadrangle: | Stokesville |
| Survey Date: | 06/16/04 |
| Downstream Starting Point: | confluence of Skidmore Fork and North River |
| Total Distance Surveyed (km): | 4.1 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 18 | 82 |
| Total Area (m ²): | 3544±854 | 16488±1854 |
| Correction Factor Applied: | 0.92 | 1.09 |
| Number of Paired Samples: | 6 | 5 |
| Total Count: | 64 | 67 |
| Number per km: | 16 | 17 |
| Mean Area (m ²): | 55 | 246 |
| Mean Maximum Depth (cm): | 51 | 28 |
| Mean Average Depth (cm): | 32 | 14 |
| Mean Residual Depth (cm): | 14 | -- |
| Percent Surveyed as Glides: | 11 | -- |
| Percent Surveyed as Runs: | -- | 24 |
| Percent Surveyed as Cascades: | -- | 0 |
| Percent with >35% Fines: | 0 | 0 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 30 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 10 |
| > 5 m long, > 55 cm diameter: | 2 |
| Total: | 42 |

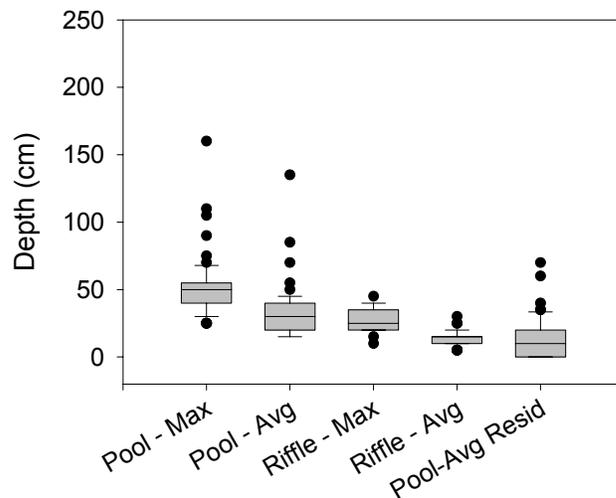
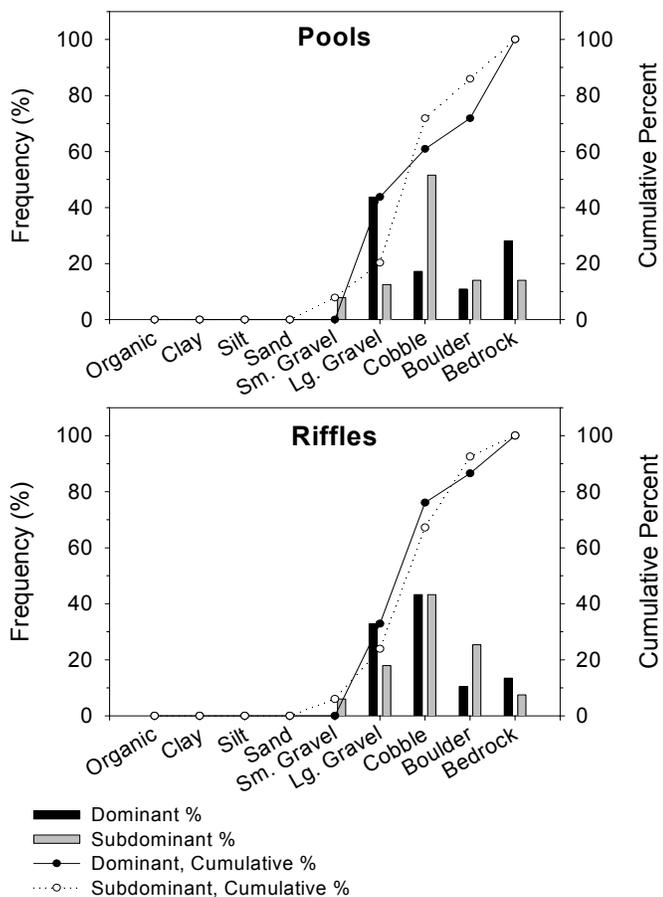
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 18 | 4 |
| Maximum | 34 | 21 |
| 75 th Percentile | 19 | 4 |
| 25 th Percentile | 13 | 1 |
| Minimum | 10 | 1 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

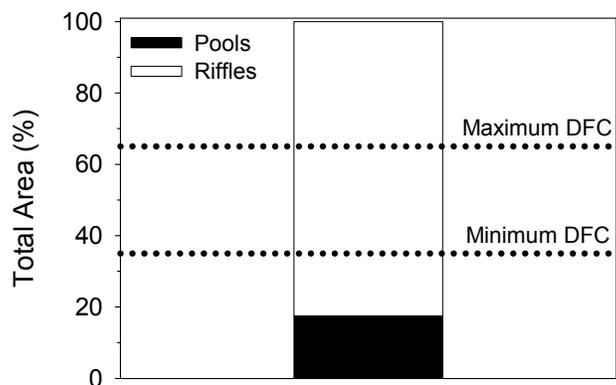
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 0 |
| B: | 100 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 10 |
| Mean Channel Gradient (%): | 2 |
| Median Water Temperature (C): | 19 |

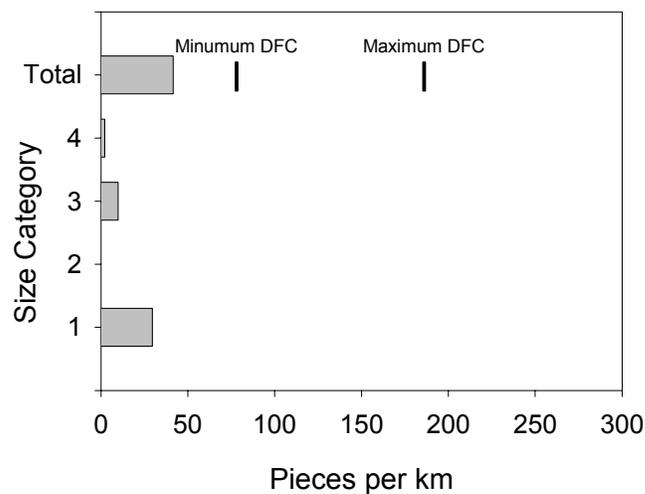


Maximum and average depths and residual pool depths for pools and riffles in Skidmore Fork, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Skidmore Fork summer 2004.



Estimated area of Skidmore Fork in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Skidmore Fork, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

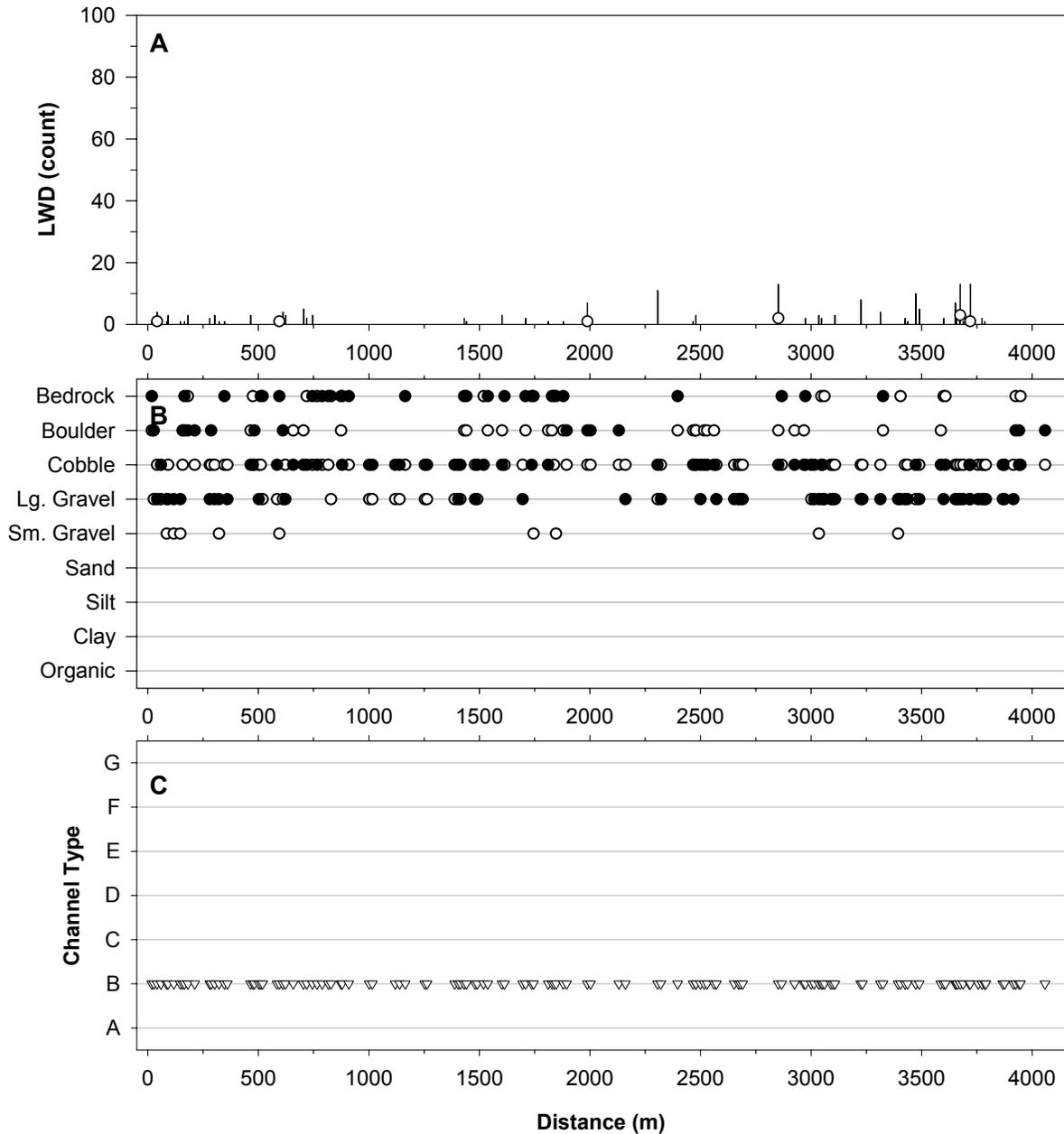
Stream features found on Skidmore Fork during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|---|
| SIDE CHANNEL | 85.4 | | SIDE CHANNEL IN ON RIGHT |
| FORD | 494 | | HORSE TRAIL CROSSING |
| SIDE CHANNEL | 561.7 | | LEFT,EXITS AT 574 |
| FORD | 705 | | TRAIL CROSSING |
| SIDE CHANNEL | 750 | | NATURAL BREAK AT 750.5, SCH LEFT |
| TRIBUTARY | 781 | | |
| TRIBUTARY | 801.5 | | ENTERS ON RIGHT |
| CULVERT | 1015.7 | | |
| CULVERT | 1262.9 | | |
| BRIDGE | 1538 | | |
| SIDE CHANNEL | 1650.5 | | EXIT ON RIGHT |
| SIDE CHANNEL | 1650.7 | | ENTERS IN ON RIGHT |
| TRIBUTARY | 1652.8 | | ENTERS ON LEFT |
| SIDE CHANNEL | 2226 | | ENTERS LEFT |
| SIDE CHANNEL | 2306 | | EXITS LEFT, DEBRIS DAM |
| SIDE CHANNEL | 2502 | | ENTERS RIGHT AT 2505 |
| TRIBUTARY | 2582.1 | | ENTERS ON RIGHT |
| FORD | 2586 | | TRAIL CROSSING |
| TRIBUTARY | 2706.2 | | LEFT |
| TRIBUTARY | 3625 | | TRIB ENTERS RIGHT |
| BRIDGE | 3745.2 | | WOODEN BRIDGE FOR WHITE OAK RECREATION TRAIL |
| FORD | 3846 | | VEHICLE CROSSING |

Stream crossings encountered on Skidmore Fork during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

| | |
|-------------------------|------------|
| Crossing type: | Culvert |
| Distance (m): | 1015.7 |
| Road number/trail name: | FR 95 |
| Culvert type: | Pipe |
| Culvert outlets (n): | 2 |
| Culvert diameter (cm): | 225 |
| Culvert height (cm): | 175 |
| Culvert material: | Metal Pipe |
| Culvert perch (cm): | 15 |
| Substrate (y/n): | N |
| Photos (y/n): | Y |
| Comments: | |

| | |
|-------------------------|------------|
| Crossing type: | Culvert |
| Distance (m): | 1262.9 |
| Road number/trail name: | FR 95 |
| Culvert type: | Pipe |
| Culvert outlets (n): | 2 |
| Culvert diameter (cm): | 300 |
| Culvert height (cm): | 175 |
| Culvert material: | Metal Pipe |
| Culvert perch (cm): | 10 |
| Substrate (y/n): | N |
| Photos (y/n): | Y |
| Comments: | |



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Skidmore Fork, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from confluence of Skidmore Fork and North River. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Skidmore Fork during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|---|
| RIFFLE | 10 | 510.8 | |
| RUN | 17 | 816.6 | SEEPS ALONG LEFT BANK |
| RIFFLE | 77 | 3608.1 | |
| BRIDGE | | 3745.2 | WOODEN BRIDGE FOR WHITE OAK RECREATION TRAIL |
| FORD | | 3846 | VEHICLE CROSSING |

| Stream: | Stony Run |
|-------------------------------|---|
| District: | Dry River |
| USGS Quadrangle: | Stokesville |
| Survey Date: | 06/24/04 |
| Downstream Starting Point: | 4248416N, 660506E; National Forest Boundary above Tillman Road Bridge |
| Total Distance Surveyed (km): | 3.6 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 18 | 82 |
| Total Area (m ²): | 1436±227 | 6452±1125 |
| Correction Factor Applied: | 0.96 | 1.12 |
| Number of Paired Samples: | 8 | 9 |
| Total Count: | 81 | 90 |
| Number per km: | 22 | 25 |
| Mean Area (m ²): | 18 | 72 |
| Mean Maximum Depth (cm): | 42 | 18 |
| Mean Average Depth (cm): | 28 | 8 |
| Mean Residual Depth (cm): | 20 | -- |
| Percent Surveyed as Glides: | 0 | -- |
| Percent Surveyed as Runs: | -- | 0 |
| Percent Surveyed as Cascades: | -- | 2 |
| Percent with >35% Fines: | 25 | 3 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 22 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 17 |
| > 5 m long, > 55 cm diameter: | 3 |
| Total: | 42 |

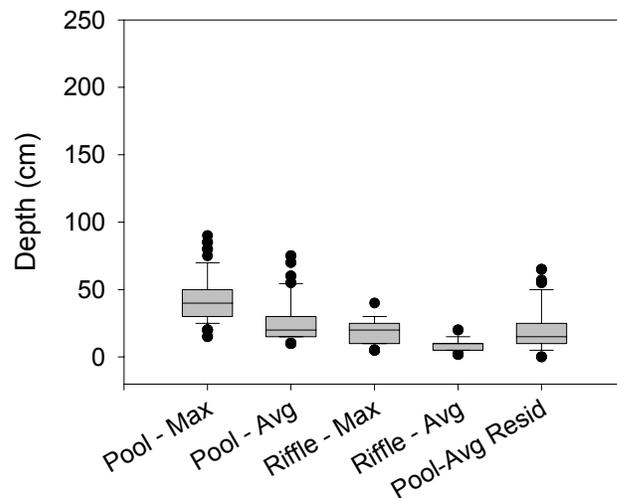
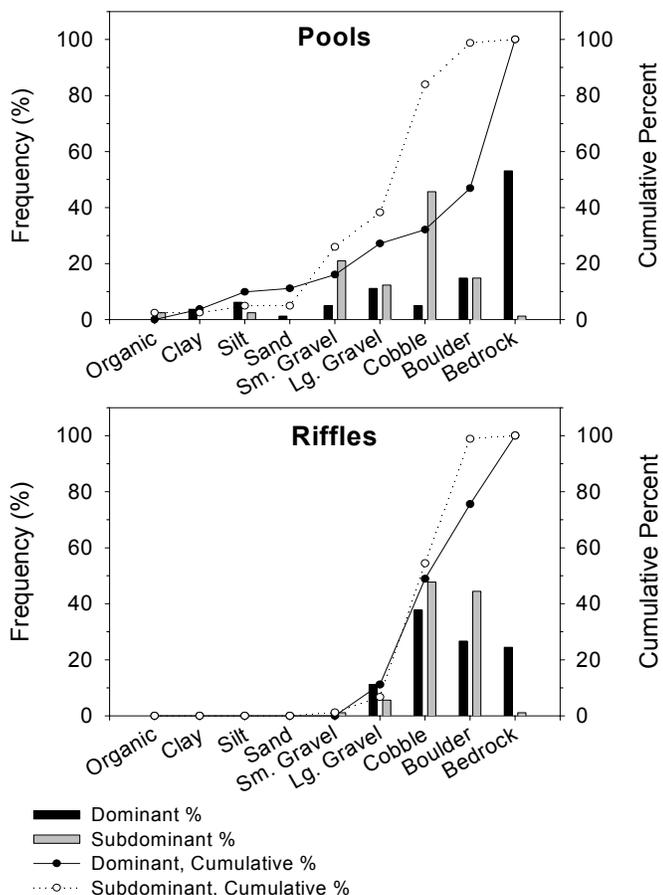
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 10 | 2 |
| Maximum | 17 | 5 |
| 75 th Percentile | 12 | 2 |
| 25 th Percentile | 8 | 1 |
| Minimum | 5 | 1 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

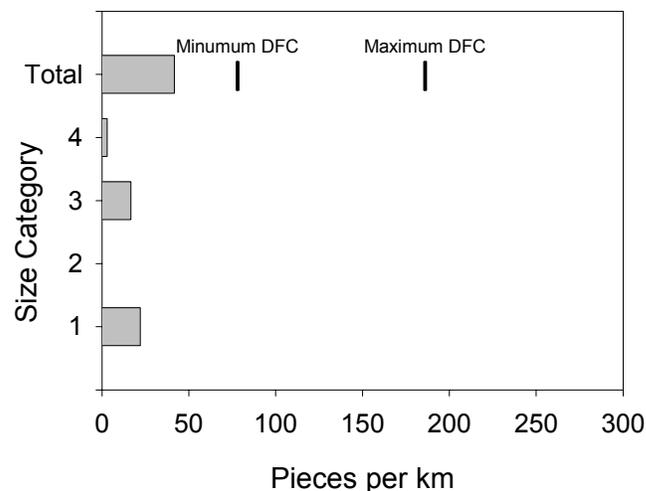
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 76 |
| B: | 24 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 6 |
| Mean Channel Gradient (%): | 9 |
| Median Water Temperature (C): | 14 |



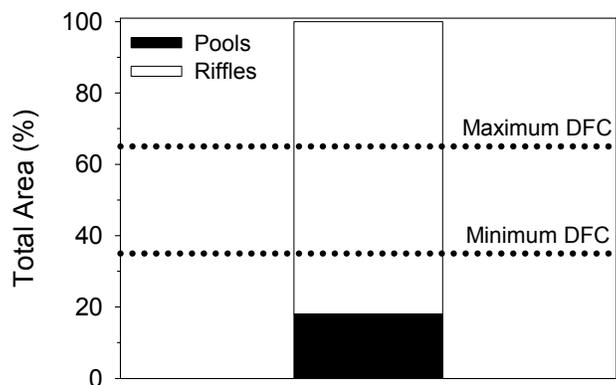
Maximum and average depths and residual pool depths for pools and riffles in Stony Run, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Stony Run, summer 2004.



LWD per kilometer in Stony Run, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter



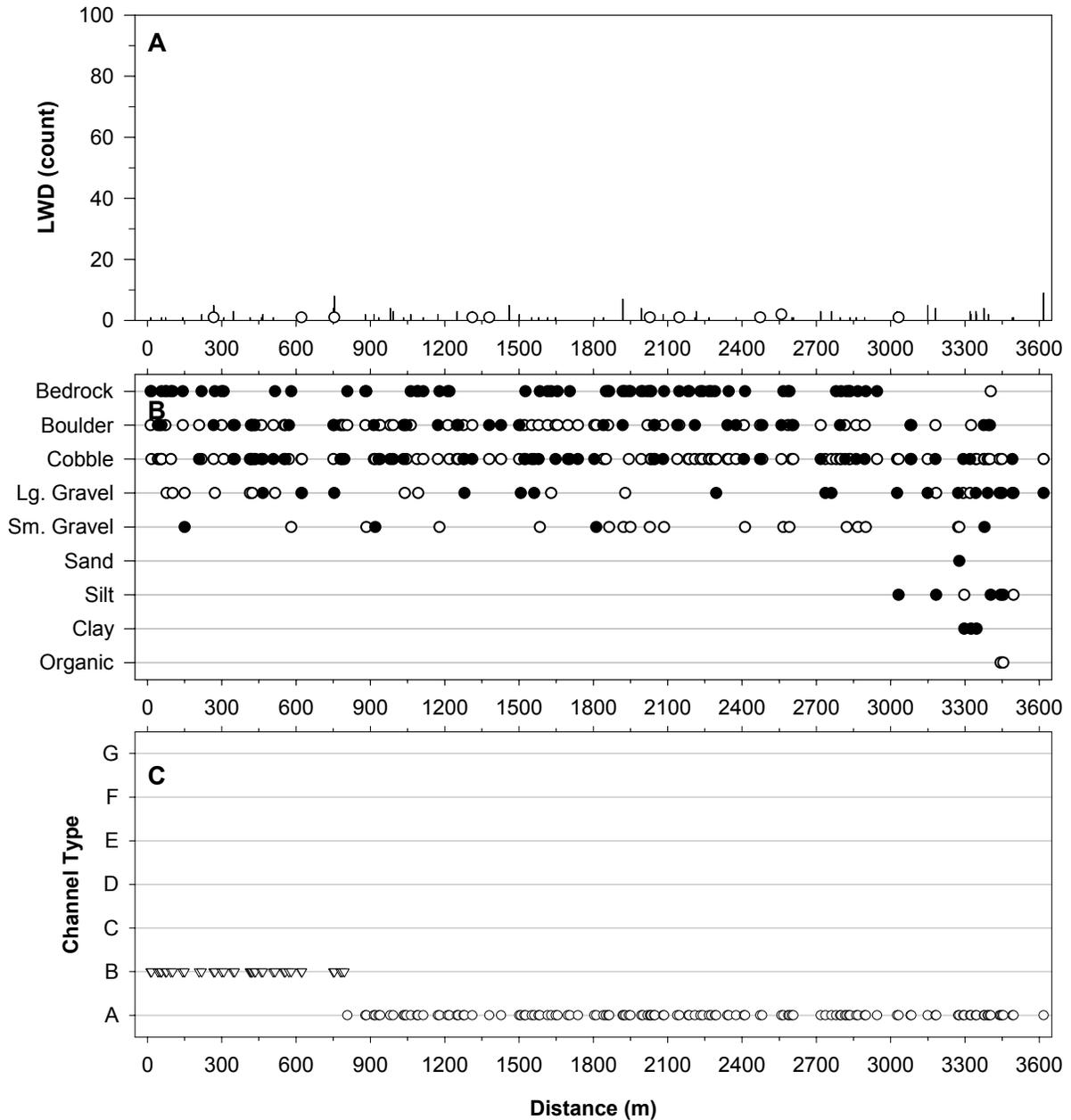
Estimated area of Stony Run in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.

Stream features found on Stony Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|--|
| SIDE CHANNEL | 301 | | IN ON LEFT |
| SIDE CHANNEL | 355 | | OUT ON LEFT |
| FORD | 366 | | TRAIL CROSSING |
| UNDERGROUND | 1017.9 | | FROM 992 m TO 1017.9 m |
| FORD | 1033.1 | | TRAIL CROSSING |
| UNDERGROUND | 1102.8 | | FROM 1093 m TO 1102.8 m |
| SIDE CHANNEL | 1222.4 | | IN ON LEFT. DRY. |
| SIDE CHANNEL | 1249.8 | | OUT ON LEFT |
| SIDE CHANNEL | 1356.6 | | IN ON RIGHT |
| UNDERGROUND | 1422 | | FROM 1380 m TO 1422 m |
| UNDERGROUND | 1460 | | FROM 1427.5 m TO 1460 m |
| FORD | 1803.4 | | TRAIL COMES IN ON LEFT AND ENDS AT STREAM CHANNEL. |
| TRIBUTARY | 1803.4 | | IN ON RIGHT. DRY. |
| FORD | 2044.4 | | TRAIL CROSSING |
| SIDE CHANNEL | 2113 | | IN ON LEFT |
| SIDE CHANNEL | 2170 | | OUT ON LEFT |
| UNDERGROUND | 2215.6 | | FROM 2210 m TO 2215.6 m |
| TRIBUTARY | 2319.4 | 0.2 | IN ON RIGHT |
| SIDE CHANNEL | 2687.6 | | IN ON LEFT |
| SIDE CHANNEL | 2717 | | OUT ON LEFT |
| SIDE CHANNEL | 3257.5 | | IN ON LEFT |
| SIDE CHANNEL | 3271.6 | | OUT ON LEFT |
| UNDERGROUND | 3430 | | FROM 3403.7 m TO 3430 m |

Stream crossings encountered on Stony Run during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described
Distance (m):
Road number/trail name:
Culvert type:
Culvert outlets (n):
Culvert diameter (cm):
Culvert height (cm):
Culvert material:
Culvert perch (cm):
Substrate (y/n):
Photos (y/n):
Comments:



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Stony Run, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from Tillman Road Bridge, beginning at National Forest Boundary. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Stony Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-----------------|
| RIFFLE | 8 | 267.3 | |
| RIFFLE | 28 | 1045.5 | |
| RIFFLE | 38 | 1551.1 | |
| RIFFLE | 48 | 1928.8 | |
| CASCADE | 58 | 2266.7 | |
| RIFFLE | 68 | 2761.3 | |
| RIFFLE | 78 | 3180.4 | |
| RIFFLE | 88 | 3491 | |

| Stream: | Tunnel Hollow |
|-------------------------------|---|
| District: | Dry River |
| USGS Quadrangle: | Stokesville |
| Survey Date: | 06/28/04 |
| Downstream Starting Point: | 4241098N, 659068E; 20M north of 728 Culvert |
| Total Distance Surveyed (km): | 1.7 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 24 | 76 |
| Total Area (m ²): | 749±225 | 2353±383 |
| Correction Factor Applied: | 0.68 | 0.83 |
| Number of Paired Samples: | 4 | 5 |
| Total Count: | 40 | 42 |
| Number per km: | 23 | 24 |
| Mean Area (m ²): | 19 | 56 |
| Mean Maximum Depth (cm): | 34 | 17 |
| Mean Average Depth (cm): | 18 | 9 |
| Mean Residual Depth (cm): | 13 | -- |
| Percent Surveyed as Glides: | 20 | -- |
| Percent Surveyed as Runs: | -- | 0 |
| Percent Surveyed as Cascades: | -- | 0 |
| Percent with >35% Fines: | 40 | 10 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 11 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 7 |
| > 5 m long, > 55 cm diameter: | 3 |
| Total: | 21 |

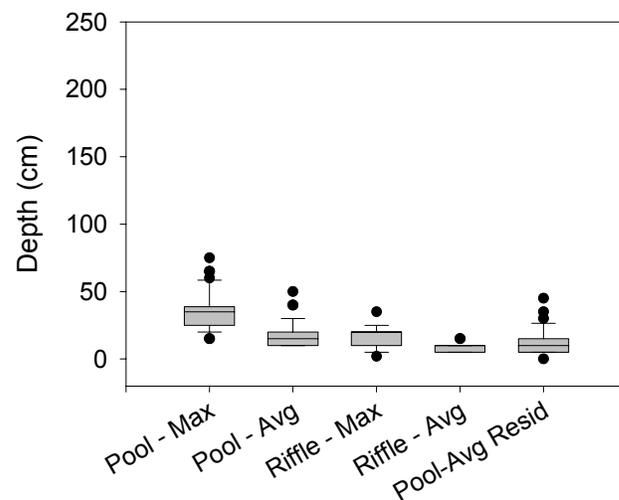
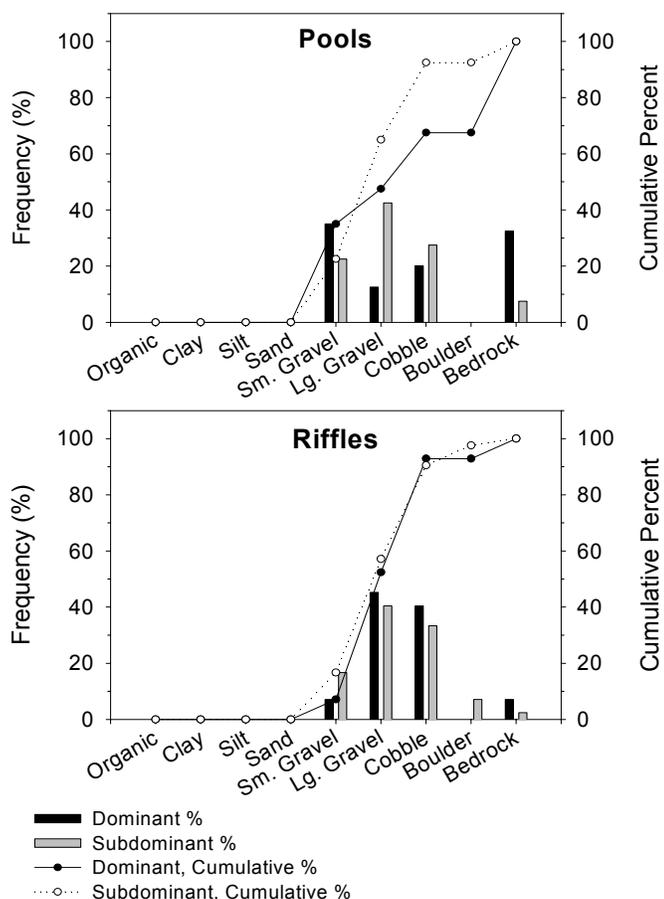
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 9 | 2 |
| Maximum | 13 | 7 |
| 75 th Percentile | 11 | 1 |
| 25 th Percentile | 9 | 1 |
| Minimum | 4 | 1 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

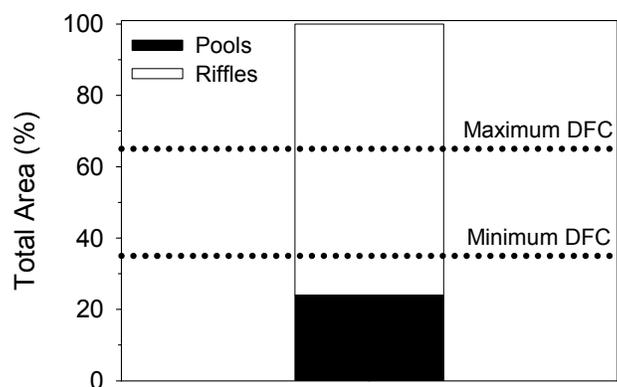
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 0 |
| B: | 100 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 6 |
| Mean Channel Gradient (%): | 3 |
| Median Water Temperature (C): | 16 |

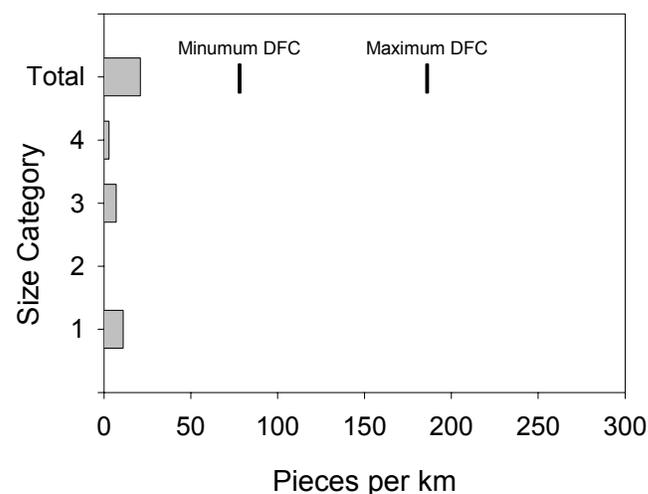


Maximum and average depths and residual pool depths for pools and riffles in Tunnel Hollow, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Tunnel Hollow, summer 2004.



Estimated area of Tunnel Hollow in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Tunnel Hollow summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Tunnel Hollow during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|---|
| FORD | 381.2 | | VEHICLE CROSSING, ROAD ON MAP |
| FORD | 881.7 | | VEHICLE CROSSING, ROAD ON MAP |
| FORD | 922.2 | | VEHICLE CROSSING, ROAD ON MAP |
| FORD | 1045.1 | | VEHICLE CROSSING, ROAD ON MAP |
| FORD | 1087.1 | | VEHICLE CROSSING, ROAD ON MAP |
| FORD | 118.4 | | VEHICLE CROSSING, ROAD ON MAP |
| FORD | 1148.2 | | VEHICLE CROSSING, ROAD ON MAP |
| SIDE CHANNEL | 833.7 | | IN ON RIGHT |
| TRIBUTARY | 619.1 | | IN ON RIGHT. DRY. |
| TRIBUTARY | 1249.3 | 0.5 | IN ON LEFT |
| TRIBUTARY | 1368.1 | 1 | IN ON RIGHT |
| TRIBUTARY | 1598.5 | 1.5 | IN ON RIGHT |
| UNDERGROUND | 1716.2 | | STREAM BED INTERSECTS MOUNTAIN. ROAD ON LEFT SIDE OF STREAM. END TIME 20:00, 6/28/04. |

Stream crossings encountered on Tunnel Hollow during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

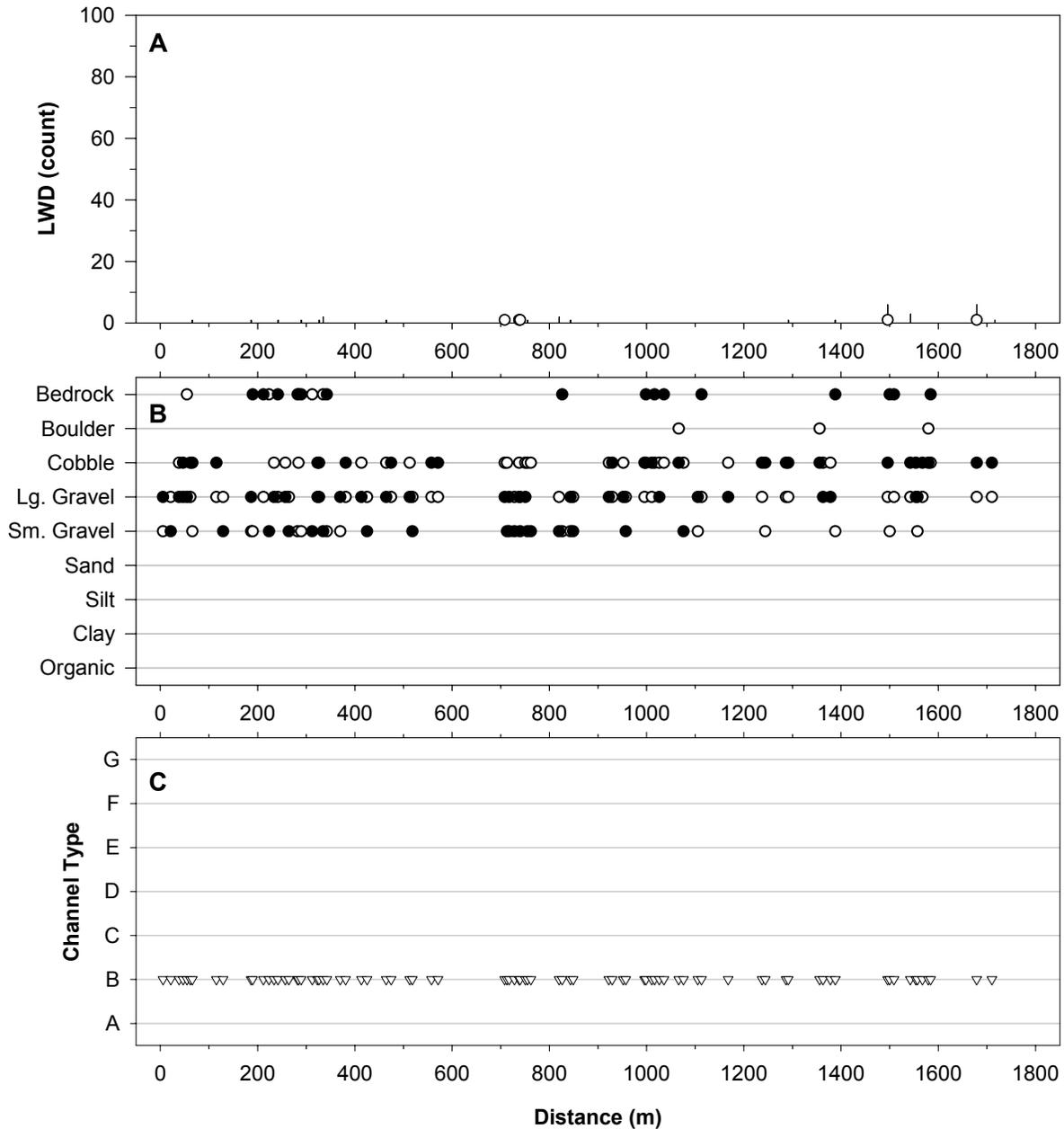
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

Comments:



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Tunnel Hollow summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance from 20m upstream of Rt. 728 culvert. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Tunnel Hollow during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|----------------------------|
| RIFFLE | 1 | 21.4 | |
| RIFFLE | 11 | 326.4 | TOILET DISCARDED IN STREAM |
| RIFFLE | 21 | 750.6 | |
| RIFFLE | 31 | 1167.7 | BREAK |
| RIFFLE | 41 | 1678.9 | BREAK |

| Stream: | White Oak Run |
|-------------------------------|---|
| District: | Dry River |
| USGS Quadrangle: | Stokesville |
| Survey Date: | 06/22/04 |
| Downstream Starting Point: | 4207491N, 675585E; confluence of White Oak Run and North River, just above Elkhorn Lake on FS 533 |
| Total Distance Surveyed (km): | 4.2 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 61 | 39 |
| Total Area (m ²): | 10927±1528 | 6992±1078 |
| Correction Factor Applied: | 1.00 | 1.01 |
| Number of Paired Samples: | 25 | 21 |
| Total Count: | 128 | 106 |
| Number per km: | 30 | 25 |
| Mean Area (m ²): | 85 | 66 |
| Mean Maximum Depth (cm): | 49 | 17 |
| Mean Average Depth (cm): | 33 | 10 |
| Mean Residual Depth (cm): | 23 | -- |
| Percent Surveyed as Glides: | 5 | -- |
| Percent Surveyed as Runs: | -- | 0 |
| Percent Surveyed as Cascades: | -- | 0 |
| Percent with >35% Fines: | 52 | 8 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 4 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 41 |
| > 5 m long, > 55 cm diameter: | 14 |
| Total: | 59 |

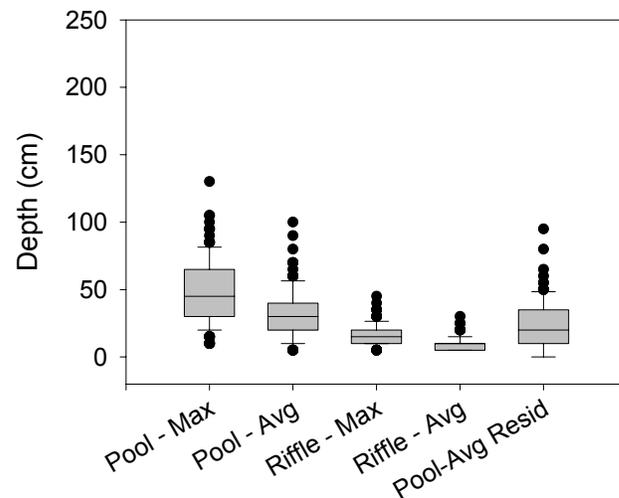
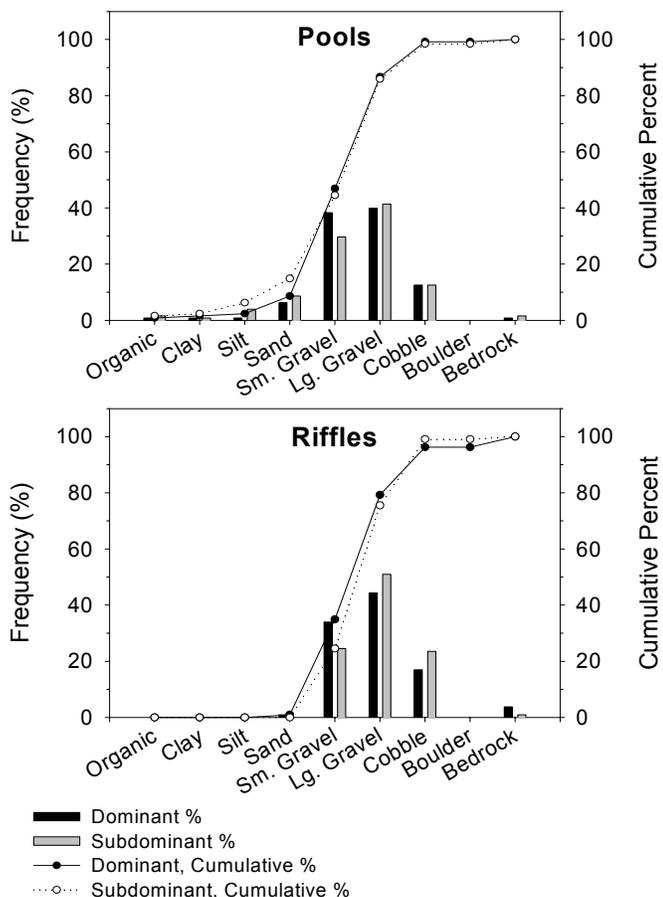
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 12 | 3 |
| Maximum | 86 | 50 |
| 75 th Percentile | 12 | 1 |
| 25 th Percentile | 7 | 0 |
| Minimum | 3 | 0 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

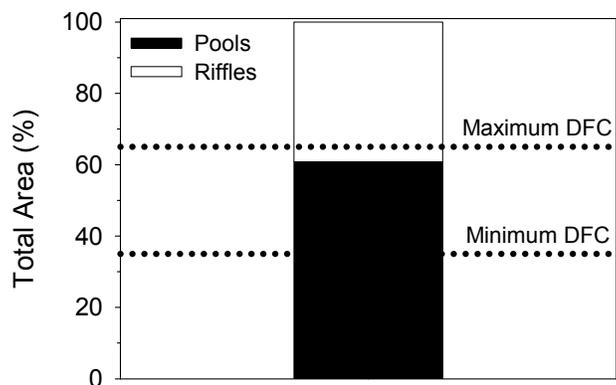
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 0 |
| B: | 0 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 100 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 7 |
| Mean Channel Gradient (%): | 2 |
| Median Water Temperature (C): | 19 |

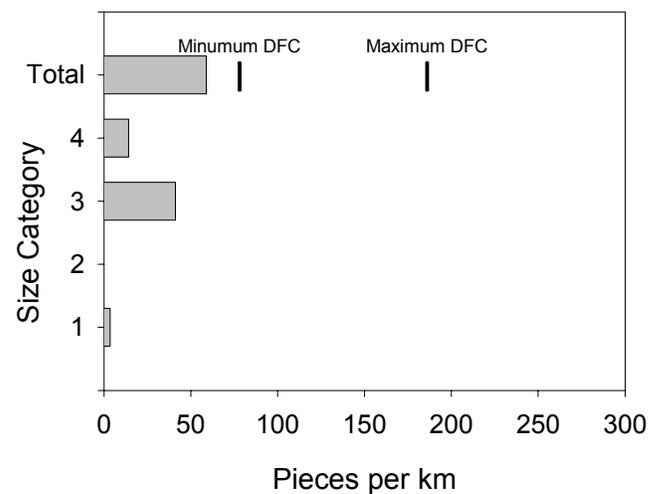


Maximum and average depths and residual pool depths for pools and riffles in White Oak Run, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in White Oak Run, summer 2004.



Estimated area of White Oak Run in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in White Oak Run, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on White Oak Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|--|
| SIDE CHANNEL | 157 | | RIGHT |
| SIDE CHANNEL | 177 | | |
| TRIBUTARY | 227 | | RIGHT |
| CULVERT | 381 | | |
| UNDERGROUND | 758.5 | | FROM 750.2 m TO 758.5 m |
| TRIBUTARY | 1209.5 | 5 | RIGHT |
| TRIBUTARY | 1376.4 | 2 | |
| BRIDGE | 1600 | | |
| UNDERGROUND | 2221.4 | | FROM 2214.5 m TO 2221.4 m |
| UNDERGROUND | 2238.1 | | FROM 2228.9 m TO 2238.1 m |
| UNDERGROUND | 2372.1 | | FROM 2358.5 m TO 2372.1 m |
| UNDERGROUND | 2547.6 | | FROM 2531.3 m TO 2547.6 m |
| TRIBUTARY | 2695.2 | 1 | DRY |
| SEEP | 2977 | | LEFT |
| TRIBUTARY | 3059.1 | 1 | DRY |
| SIDE CHANNEL | 3202 | | IN RIGHT |
| UNDERGROUND | 3228.5 | | FROM 3217 m TO 3228.5 m |
| SIDE CHANNEL | 3234 | | OUT RIGHT |
| UNDERGROUND | 3263.4 | | FROM 3235.3 m TO 3263.4 m |
| UNDERGROUND | 3286.1 | | FROM 3278.8 m TO 3286.1 m; BEAVER DAM AT TOP OF UNDERGROUND SECTION |
| UNDERGROUND | 3444.2 | | FROM 3439.8 m TO 3444.2 m |
| TRIBUTARY | 3570.7 | 3 | DRY |
| TRIBUTARY | 3590 | 1 | |
| UNDERGROUND | 3648.7 | | FROM 3600 m TO 3648.7 m |
| UNDERGROUND | 3750.1 | | FROM 3653.3 m TO 3750.1 m |
| CULVERT | 3781.8 | | |
| CULVERT | 3794.2 | | UP STREAM SIDE |
| SEEP | 4001 | | |
| CULVERT | 4850 | | 2 PICS, US AND DS, US END BLOCKED BY BEAVER DAM |
| END | 4900 | | LOW FLOW ABOVE ROAD, LESS THAN .5M WIDE |

Stokesville

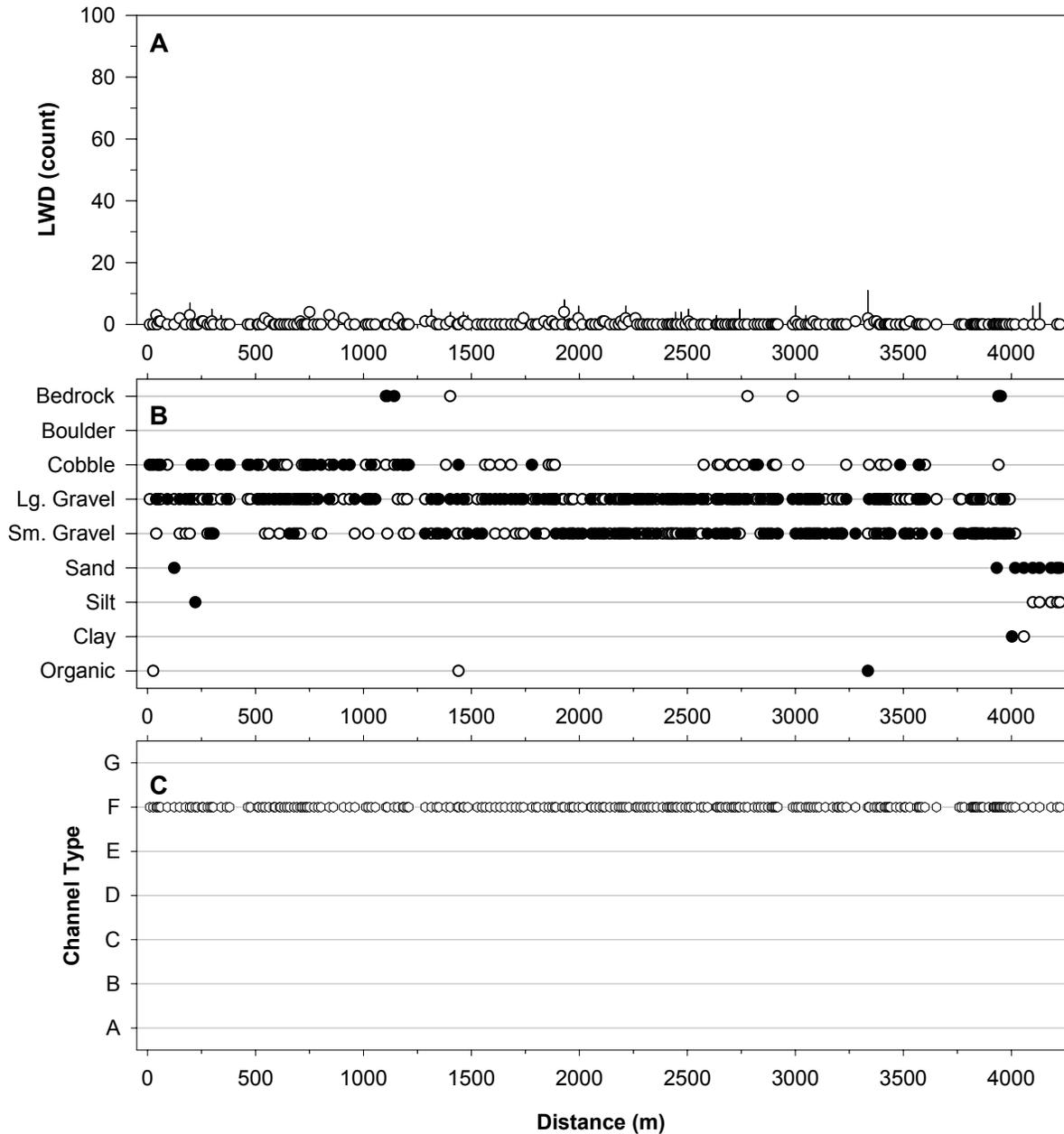
Stream crossings encountered on White Oak Run during BVET habitat inventory, summer 2004.
Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

| | |
|-------------------------|-----------------|
| Crossing type: | Culvert |
| Distance (m): | 381.8 |
| Road number/trail name: | 95 |
| Culvert type: | Pipe |
| Culvert outlets (n): | 2 |
| Culvert diameter (cm): | 300 |
| Culvert height (cm): | 210 |
| Culvert material: | Steel |
| Culvert perch (cm): | 0 |
| Substrate (y/n): | N |
| Photos (y/n): | Y |
| Comments: | Concrete bottom |

| | |
|-------------------------|--------|
| Crossing type: | Bridge |
| Distance (m): | 1600 |
| Road number/trail name: | 96 |
| Culvert type: | |
| Culvert outlets (n): | |
| Culvert diameter (cm): | |
| Culvert height (cm): | |
| Culvert material: | |
| Culvert perch (cm): | |
| Substrate (y/n): | Y |
| Photos (y/n): | Y |
| Comments: | none |

| | |
|-------------------------|---------|
| Crossing type: | Culvert |
| Distance (m): | 3781.8 |
| Road number/trail name: | 96 |
| Culvert type: | Pipe |
| Culvert outlets (n): | 1 |
| Culvert diameter (cm): | 140 |
| Culvert height (cm): | 95 |
| Culvert material: | Steel |
| Culvert perch (cm): | 0 |
| Substrate (y/n): | Y |
| Photos (y/n): | Y |
| Comments: | none |

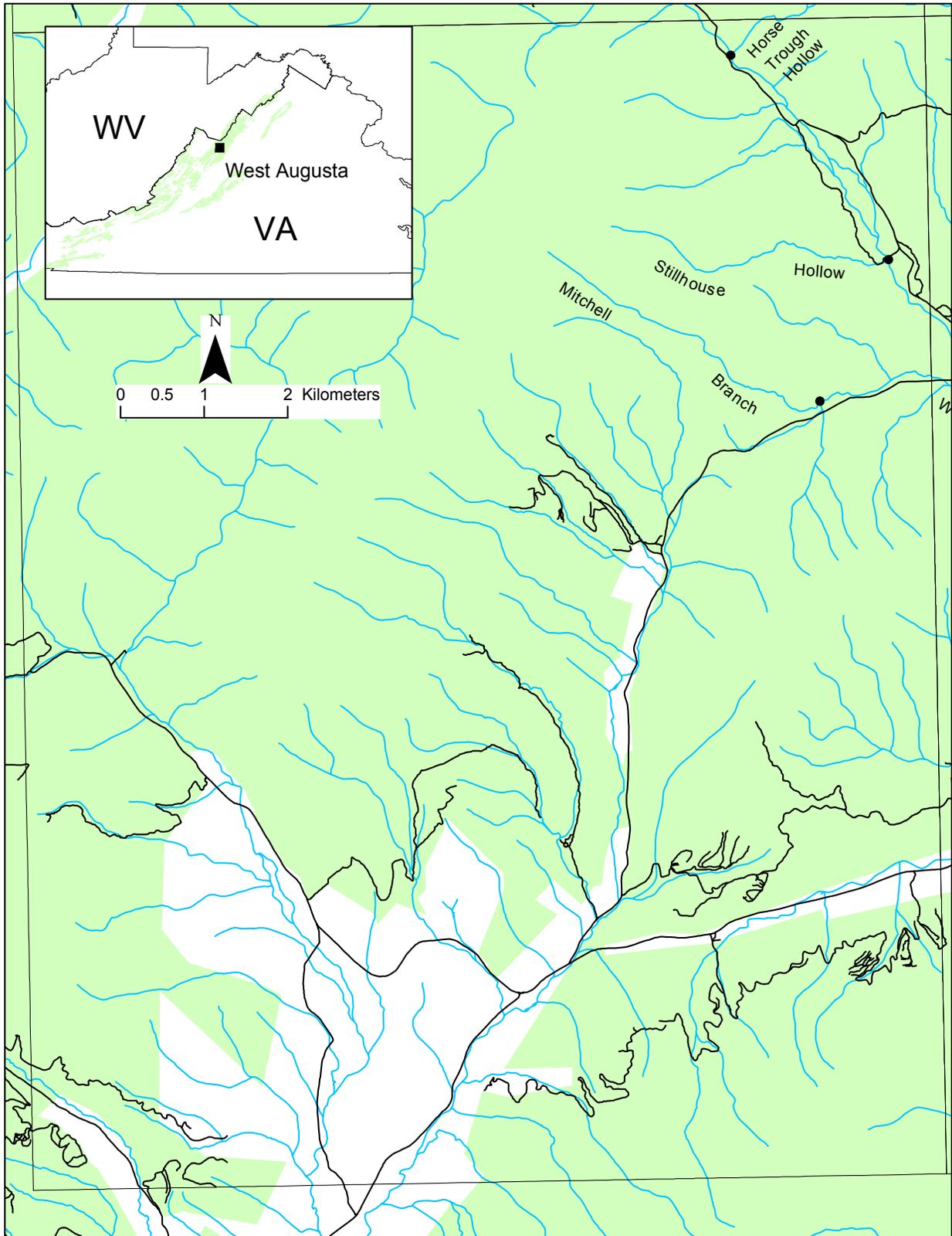
| | |
|-------------------------|--------------|
| Crossing type: | Culvert |
| Distance (m): | 4850 |
| Road number/trail name: | 96 |
| Culvert type: | Pipe |
| Culvert outlets (n): | 1 |
| Culvert diameter (cm): | 90 |
| Culvert height (cm): | 95 |
| Culvert material: | Steel |
| Culvert perch (cm): | 0 |
| Substrate (y/n): | N |
| Photos (y/n): | Y |
| Comments: | Steel bottom |



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in White Oak Run, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from confluence of White Oak Run and North River. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on White Oak Run during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|---|
| POOL | 14 | 514.8 | |
| RIFFLE | 14 | 532.3 | |
| RIFFLE | 19 | 691.8 | |
| RIFFLE | 24 | 935.5 | |
| RIFFLE | 29 | 1182 | |
| RIFFLE | 34 | 1433.9 | |
| RIFFLE | 39 | 1633.1 | |
| RIFFLE | 44 | 1857.4 | |
| RIFFLE | 49 | 2013.5 | |
| RIFFLE | 55 | 2267.6 | VERY LOW FLOW, SKIPPED PREVIOUS MEASURED RIFFLE |
| RIFFLE | 59 | 2415.8 | |
| RIFFLE | 69 | 2713.2 | |
| RIFFLE | 74 | 2873 | ~10 M FROM FS 96 |
| RIFFLE | 79 | 3047.8 | |
| RIFFLE | 84 | 3214.2 | SPLIT CHANNEL, SEE PHOTO |
| UNDERGROUND | | 3286.1 | BEAVER DAM AT TOP OF UNDERGROUND SECTION |
| RIFFLE | 69 | 3485.2 | |
| RIFFLE | 74 | 3768.8 | JUST NEXT TO ROAD |
| RIFFLE | 79 | 3869.5 | |
| RIFFLE | 84 | 3967.7 | |
| CULVERT | | 4850 | 2 PICS, US AND DS, US END BLOCKED BY BEAVER DAM |



Streams inventoried on the West Augusta Quadrangle using BVET habitat surveys during summer 2004.

| | |
|-------------------------------|--|
| Stream: | Horse Trough Hollow |
| District: | Dry River |
| USGS Quadrangle: | West Augusta |
| Survey Date: | 06/15/04 |
| Downstream Starting Point: | 4248375N 650562E: confluence of North River and Horse Trough Hollow northeast of Forest Service Road |
| Total Distance Surveyed (km): | 1.8 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 65 | 35 |
| Total Area (m ²): | 1625±297 | 884±277 |
| Correction Factor Applied: | 0.99 | 1.32 |
| Number of Paired Samples: | 22 | 7 |
| Total Count: | 110 | 35 |
| Number per km: | 62 | 20 |
| Mean Area (m ²): | 15 | 25 |
| Mean Maximum Depth (cm): | 27 | 14 |
| Mean Average Depth (cm): | 16 | 7 |
| Mean Residual Depth (cm): | 9 | -- |
| Percent Surveyed as Glides: | 25 | -- |
| Percent Surveyed as Runs: | -- | 17 |
| Percent Surveyed as Cascades: | -- | 3 |
| Percent with >35% Fines: | 5 | 0 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 43 |
| < 5 m long, > 55 cm diameter: | 1 |
| > 5 m long, 10 cm – 55 cm diameter: | 23 |
| > 5 m long, > 55 cm diameter: | 6 |
| Total: | 73 |

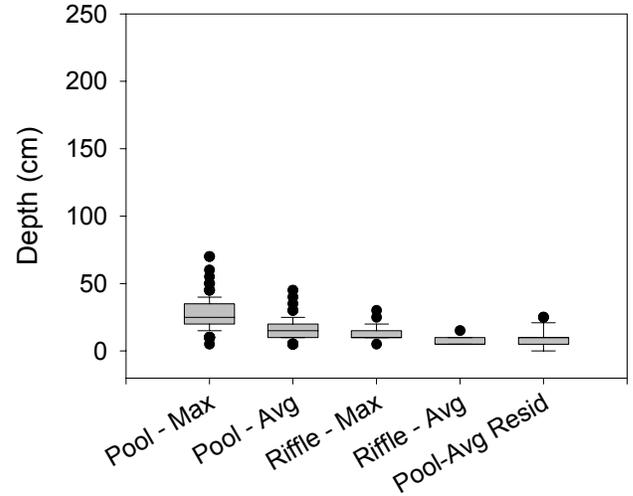
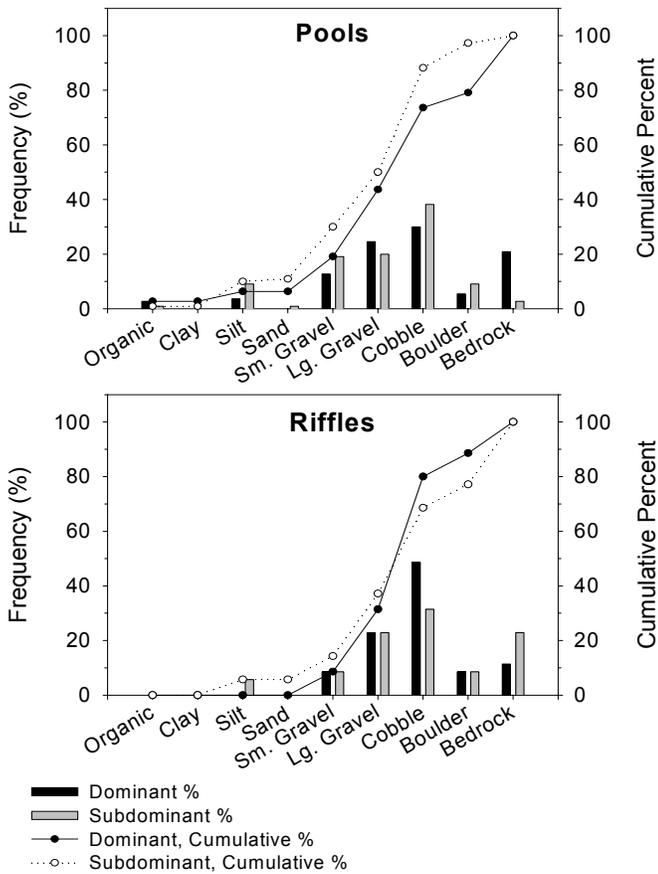
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 12 | 3 |
| Maximum | 19 | 10 |
| 75 th Percentile | 13 | 4 |
| 25 th Percentile | 10 | 1 |
| Minimum | 9 | 1 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

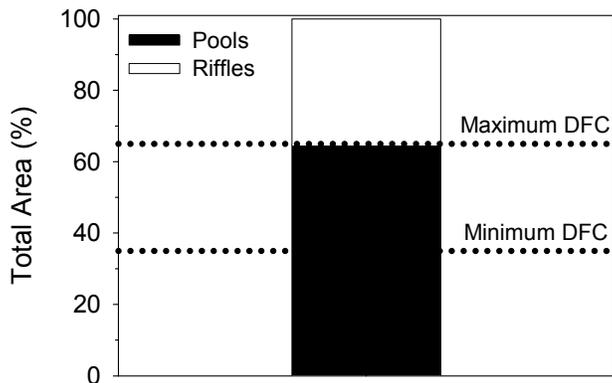
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 100 |
| B: | 0 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 6 |
| Mean Channel Gradient (%): | 6 |
| Median Water Temperature (C): | 14 |

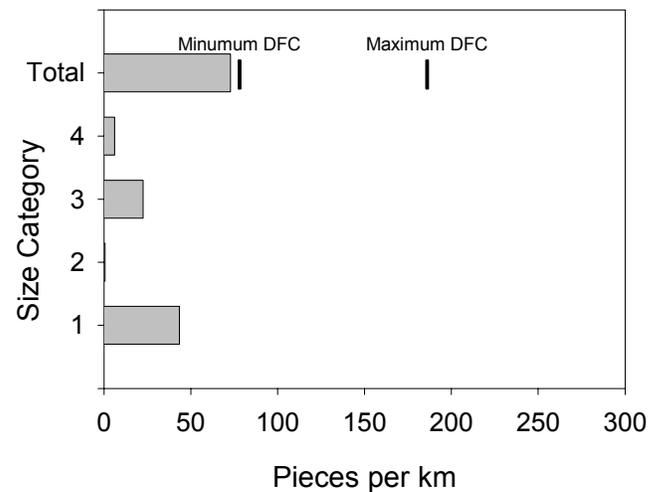


Maximum and average depths and residual pool depths for pools and riffles in Horse Trough Hollow, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Horse Trough Hollow, summer 2004.



Estimated area of Horse Trough Hollow in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Horse Trough Hollow, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Horse Trough Hollow during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|----------------|--------------|-----------|--|
| UNDERGROUND | 14.7 | | FROM 0 M TO 14.7 M; LARGE BOULDERS |
| UNDERGROUND | 55 | | FROM 18.2 M TO 55.0 M |
| UNDERGROUND | 142.9 | | FROM 141.4 M TO 142.9 M |
| UNDERGROUND | 193 | | FROM 145.5 M TO 193.0 M |
| SIDE CHANNEL | 218.1 | | IN ON RIGHT |
| UNDERGROUND | 269 | | FROM 225.4 M TO 269.0 M |
| UNDERGROUND | 435.9 | | FROM 418.7 M TO 435.9 M: BANK FELL IN TWICE ON RIGHT |
| TRIBUTARY | 602.5 | | DRY, IN ON LEFT |
| OTHER | 623.4 | | BARELY RUNNING |
| OTHER | 625.5 | | BARELY RUNNING |
| UNDERGROUND | 672.9 | | FROM 668.4 M TO 672.9 M |
| SLID | 699.3 | | ON RIGHT |
| UNDERGROUND | 739 | | FROM 729.7 M TO 739.0 M |
| UNDERGROUND | 755 | | FROM 751.8 M TO 755.0 M: LEAF PACK ON RIGHT |
| OTHER | 791.2 | | BARELY FLOWING; LEAF PACK ON RIGHT |
| OTHER | 833.1 | | BARELY FLOWING, SMALL PUDDLES |
| UNDERGROUND | 924.7 | | FROM 813.9 M TO 924.7 M |
| OTHER | 956.4 | | BARELY FLOWING |
| UNDERGROUND | 1024.3 | | FROM 1017.4 M TO 1024.3 M: BACK TO HARDWOODS |
| OTHER | 1048.9 | | BARELY ANY WATER FLOWING |
| UNDERGROUND | 1095 | | FROM 1089.3 M TO 1095.0 M |
| OTHER | 1107 | | BARELY FLOWING |
| OTHER | 1146.9 | | BARELY FLOWING |
| UNDERGROUND | 1164.8 | | FROM 1149.2 M TO 1164.8 M |
| UNDERGROUND | 1217.9 | | FROM 1214.5 M TO 1217.9 M |
| UNDERGROUND | 1230.6 | | FROM 1221.6 M TO 1230.6 M |
| FALL | 1242 | | 6 METERS HIGH |
| OTHER | 1264 | | BARELY ANY FLOW |
| FALL | 1272.8 | | 1.5 METERS HIGH |
| FALL | 1291 | | 3 METERS HIGH |
| TRIBUTARY | 1293.7 | | IN ON RIGHT |
| OTHER | 1336.4 | | CASCADE LACKING WATER |
| UNDERGROUND | 1392.1 | | FROM 1328.5 M TO 1392.1 M |
| UNDERGROUND | 1433.2 | | FROM 1425.5 M TO 1433.2 M |
| OTHER | 1443.8 | | BARELY ANY FLOW |
| UNDERGROUND | 1512 | | FROM 1455.1 M TO 1512.0 M |
| UNDERGROUND | 1525.2 | | FROM 1517.0 M TO 1525.2 M |
| UNDERGROUND | 1549.8 | | FROM 1536.3 M TO 1549.8 M |
| UNDERGROUND | 1586.1 | | FROM 1556.2 M TO 1586.1 M |
| UNDERGROUND | 1594.8 | | FROM 1588.4 M TO 1594.8 M |
| UNDERGROUND | 1602.7 | | FROM 1599.3 M TO 1602.7 M |
| UNDERGROUND | 1621.6 | | FROM 1604.3 M TO 1621.6 M |
| FALL | 1628.9 | | 3 METERS HIGH |
| OTHER | 1640.7 | | BEDROCK; TOO SMALL TO MEASURE |
| OTHER | 1663 | | NOT ENOUGH WATER TO MEASURE |

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|---|
| OTHER | 1667.9 | | BREAK IN UNITS |
| OTHER | 1682.9 | | NOT ENOUGH TO MEASURE |
| OTHER | 1696 | | NOT ENOUGH WATER; MOSS COVERED BEDROCK |
| OTHER | 1713.9 | | NOT ENOUGH WATER |
| UNDERGROUND | 1728.6 | | FROM 1715.7 M TO 1728.6 M |
| OTHER | 1735.9 | | |
| OTHER | 1760 | | NOT ENOUGH WATER |
| BRAID | | | DOWNSTREAM 373.4 UPSTREAM 384 |

Stream crossings encountered on Horse Trough Hollow during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

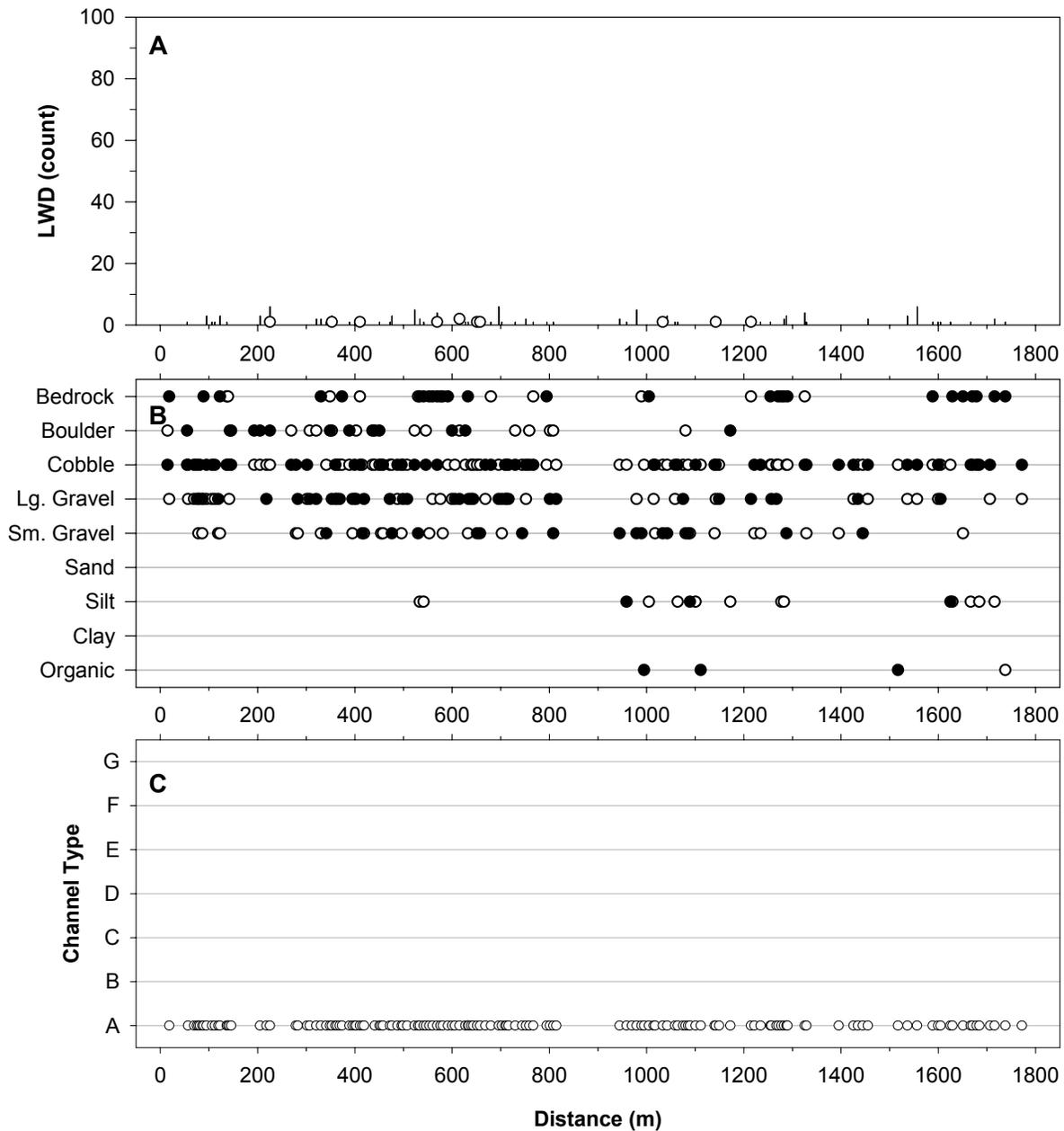
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

Comments:



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Horse Trough Hollow, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from confluence of North River and Horse Trough Hollow northeast of Forest Service Road. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Horse Trough Hollow during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|---|
| POOL | 4 | 81 | |
| GLIDE | 9 | 111.9 | |
| POOL | 14 | 145.5 | WASHED OUT BANK ON RIGHT |
| RIFFLE | 4 | 205 | |
| POOL | 19 | 330.3 | SIDE POOL ON RIGHT |
| RIFFLE | 9 | 359.9 | |
| POOL | 24 | 373.4 | WASHED OUT BANK ON RIGHT |
| GLIDE | 29 | 418.7 | |
| GLIDE | 34 | 487.5 | WASHED OUT BANK ON RIGHT |
| RIFFLE | 14 | 496 | TURNING FROM HARDWOOD TO DEAD HEMLOCKS |
| POOL | 39 | 553 | |
| RIFFLE | 19 | 591.4 | |
| POOL | 44 | 605.7 | A LOT OF MOSS COVERED BEDROCK |
| POOL | 49 | 639.2 | |
| POOL | 54 | 712.2 | |
| POOL | 59 | 758.7 | |
| RIFFLE | 24 | 766.8 | DEBRIS PILE UNDER ROOTS OF TREE ON LEFT |
| GLIDE | 64 | 944.4 | |
| POOL | 69 | 1017.4 | |
| RIFFLE | 29 | 1058.5 | |
| POOL | 74 | 1089.3 | SIDE POOL ON RIGHT |
| GLIDE | 79 | 1172.2 | |
| FALL | | 1242 | 6 METERS HIGH |
| RIFFLE | 34 | 1254.5 | |
| POOL | 84 | 1270.5 | PLUNGE POOL |
| POOL | 89 | 1328.5 | |
| GLIDE | 94 | 1455.1 | |
| POOL | 99 | 1604.3 | |
| POOL | 104 | 1669.9 | |
| POOL | 109 | 1737.7 | |

| | |
|-------------------------------|---|
| Stream: | Mitchell Branch |
| District: | Dry River |
| USGS Quadrangle: | West Augusta |
| Survey Date: | 06/16/04 |
| Downstream Starting Point: | 651608E 4243915N; confluence of White Oak Run |
| Total Distance Surveyed (km): | 1.1 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 13 | 87 |
| Total Area (m ²): | 374±328 | 2588±408 |
| Correction Factor Applied: | 1.28 | 1.88 |
| Number of Paired Samples: | 3 | 2 |
| Total Count: | 28 | 29 |
| Number per km: | 25 | 26 |
| Mean Area (m ²): | 13 | 89 |
| Mean Maximum Depth (cm): | 37 | 14 |
| Mean Average Depth (cm): | 23 | 6 |
| Mean Residual Depth (cm): | 13 | -- |
| Percent Surveyed as Glides: | 0 | -- |
| Percent Surveyed as Runs: | -- | 3 |
| Percent Surveyed as Cascades: | -- | 0 |
| Percent with >35% Fines: | 4 | 0 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 39 |
| < 5 m long, > 55 cm diameter: | 0 |
| > 5 m long, 10 cm – 55 cm diameter: | 8 |
| > 5 m long, > 55 cm diameter: | 3 |
| Total: | 50 |

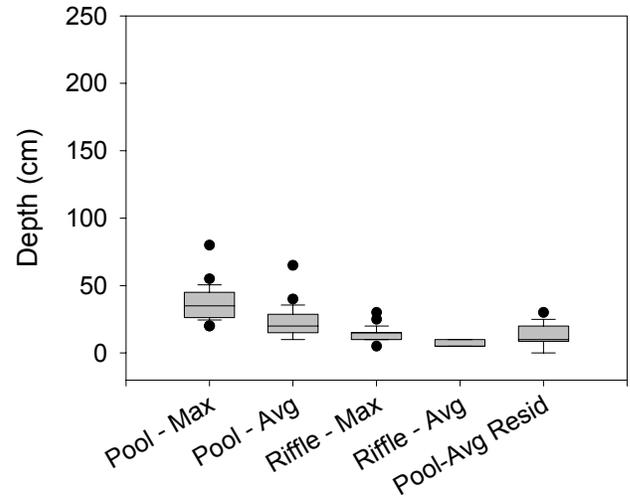
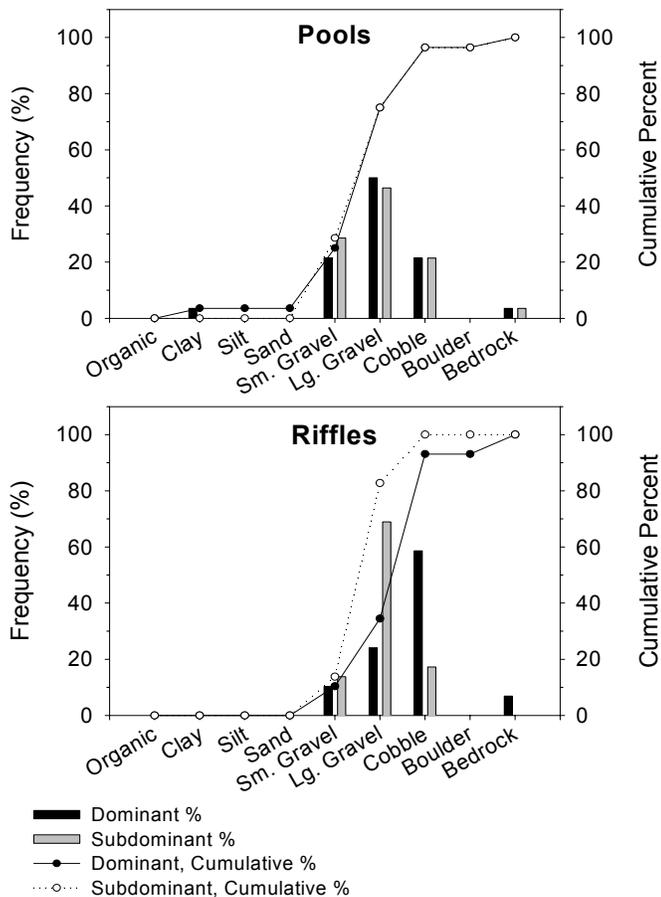
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 17 | 6 |
| Maximum | 22 | 12 |
| 75 th Percentile | 20 | 9 |
| 25 th Percentile | 14 | 2 |
| Minimum | 12 | 1 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

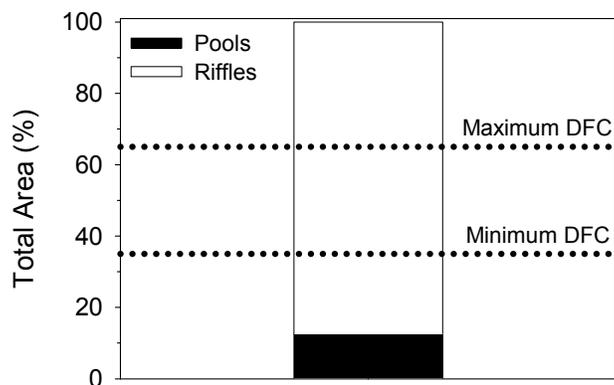
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 0 |
| B: | 0 |
| C: | 0 |
| D: | 0 |
| E: | 0 |
| F: | 100 |
| G: | 0 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 5 |
| Mean Channel Gradient (%): | 4 |
| Median Water Temperature (C): | 14 |

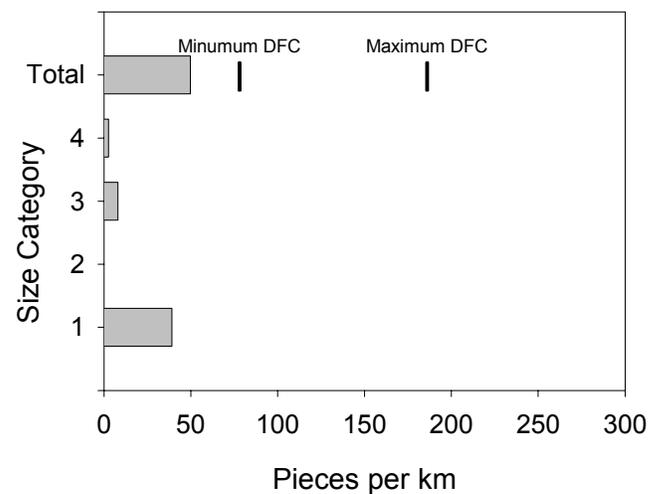


Maximum and average depths and residual pool depths for pools and riffles in Mitchell Branch, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Mitchell Branch, summer 2004.



Estimated area of Mitchell Branch in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Mitchell Branch, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

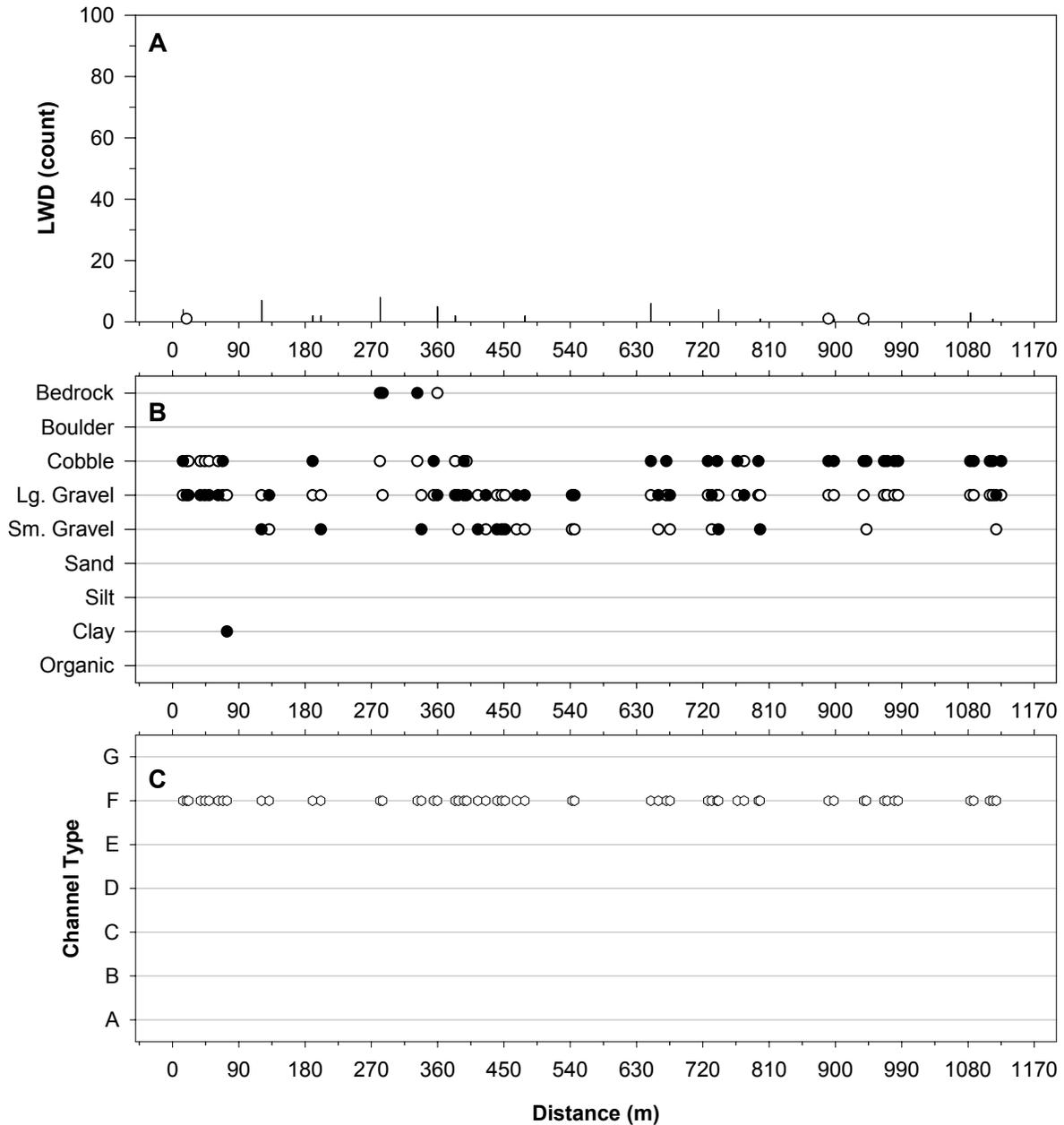
- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Mitchell Branch during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|-----------------------|
| TRIBUTARY | 765.6 | | ENTERS ON RIGHT |
| FORD | 961.6 | | HIKING TRAIL |
| TRIBUTARY | 1072 | | ENTERS ON RIGHT |
| UNDERGROUND | 1125 | | FROM 1119 m TO 1125 m |

Stream crossings encountered on Mitchell Branch during BVET habitat inventory, summer 2004.
Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

| | |
|-------------------------|--|
| Crossing type: | Ford |
| Distance (m): | 961.6 |
| Road number/trail name: | |
| Culvert type: | |
| Culvert outlets (n): | |
| Culvert diameter (cm): | |
| Culvert height (cm): | |
| Culvert material: | |
| Culvert perch (cm): | |
| Substrate (y/n): | Y |
| Photos (y/n): | Y |
| Comments: | Looks like it has not been used recently |



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Mitchell Branch, summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from confluence of White Oak Run. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Mitchell Branch during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|-----------------|
| POOL | 10 | 359.6 | |
| RIFFLE | 19 | 727 | |
| RIFFLE | 29 | 1118.5 | |

| | |
|-------------------------------|---|
| Stream: | Stillhouse Hollow |
| District: | Dry River |
| USGS Quadrangle: | West Augusta |
| Survey Date: | 06/16/04 |
| Downstream Starting Point: | 17 652385E 4245769N; confluence of Stillhouse Hollow and a side channel of North River west of Forest Service Road 95 |
| Total Distance Surveyed (km): | 3.0 |

| | Pools | Riffles |
|-------------------------------|--------------|----------------|
| Percent of Total Stream Area: | 23 | 77 |
| Total Area (m ²): | 1422±115 | 4723±554 |
| Correction Factor Applied: | 0.91 | 0.99 |
| Number of Paired Samples: | 18 | 17 |
| Total Count: | 180 | 163 |
| Number per km: | 60 | 54 |
| Mean Area (m ²): | 8 | 29 |
| Mean Maximum Depth (cm): | 25 | 14 |
| Mean Average Depth (cm): | 15 | 7 |
| Mean Residual Depth (cm): | 8 | -- |
| Percent Surveyed as Glides: | 23 | -- |
| Percent Surveyed as Runs: | -- | 2 |
| Percent Surveyed as Cascades: | -- | 6 |
| Percent with >35% Fines: | 27 | 0 |

| Large Woody Debris Size | Pieces per km |
|-------------------------------------|----------------------|
| < 5 m long, 10 cm – 55 cm diameter: | 18 |
| < 5 m long, > 55 cm diameter: | 1 |
| > 5 m long, 10 cm – 55 cm diameter: | 33 |
| > 5 m long, > 55 cm diameter: | 4 |
| Total: | 56 |

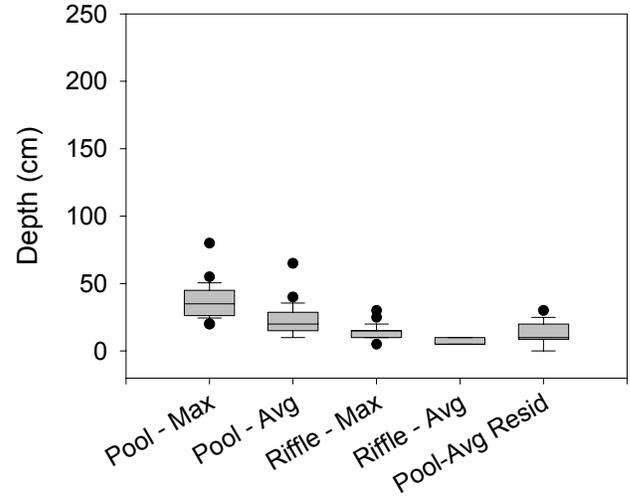
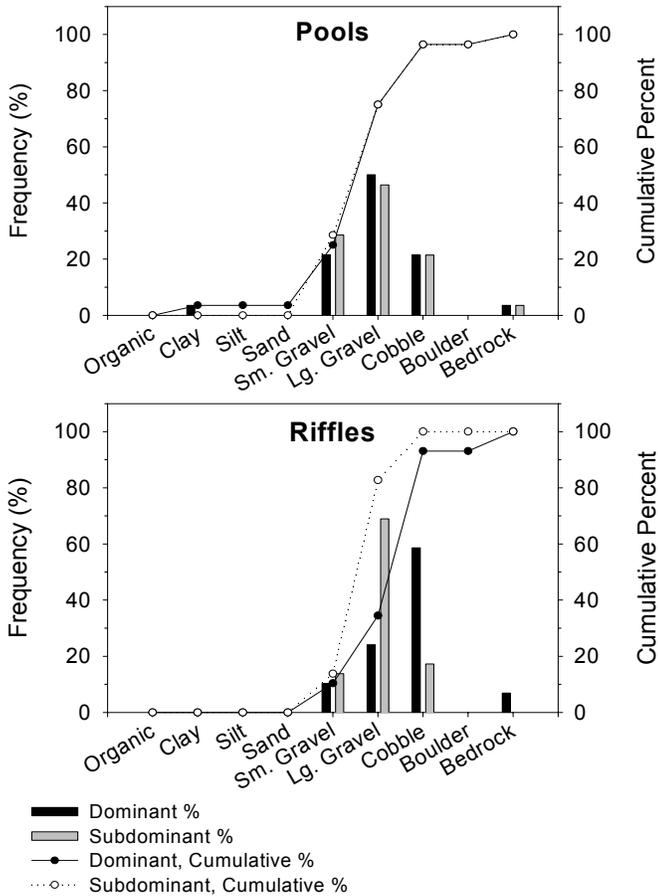
| Riparian Width | Total Width* (m) | Left & Right Width** (m) |
|-----------------------------|-------------------------|-------------------------------------|
| Mean | 13 | 4 |
| Maximum | 70 | 60 |
| 75 th Percentile | 13 | 3 |
| 25 th Percentile | 6 | 1 |
| Minimum | 4 | 0 |

*Left riparian, right riparian, and bankfull channel widths were added together for calculations

**Left and right riparian widths were grouped (not added) together for calculations

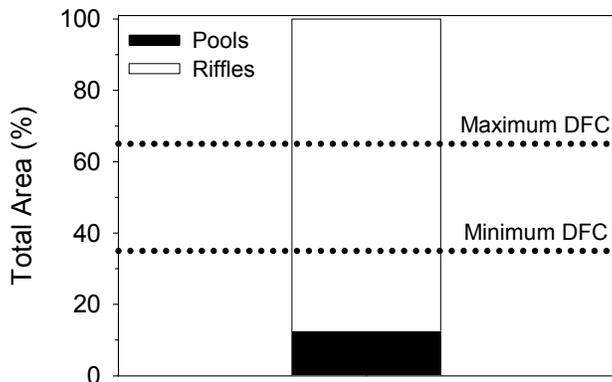
| Rosgen's Channel Type | Frequency (%) |
|------------------------------|----------------------|
| A: | 43 |
| B: | 0 |
| C: | 54 |
| D: | 0 |
| E: | 0 |
| F: | 0 |
| G: | 3 |

| Other Stream Attributes | |
|----------------------------------|----|
| Mean Bankfull Channel Width (m): | 5 |
| Mean Channel Gradient (%): | 5 |
| Median Water Temperature (C): | 17 |

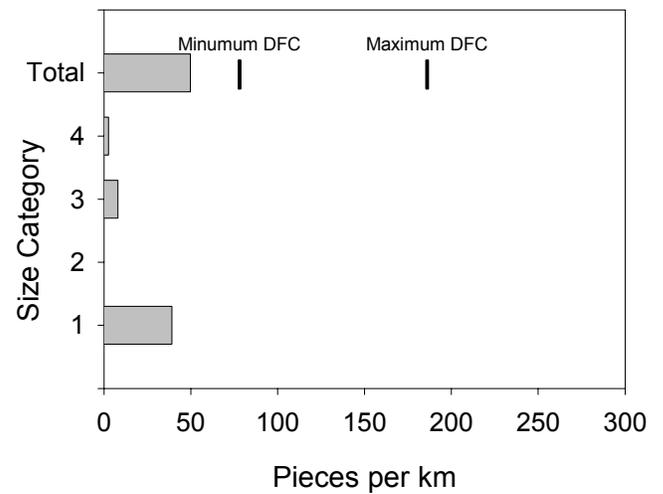


Maximum and average depths and residual pool depths for pools and riffles in Stillhouse Hollow, summer 2004. The top and bottom of the boxes represent the 25th and 75th percentiles, the bar in the center of the box represents the median, whiskers represent the 10th and 90th percentiles, and closed circles represent the entire range of the data.

Frequency (percent) and cumulative percent of dominant and subdominant substrate occurrence for pools and riffles in Stillhouse Hollow, summer 2004.



Estimated area of Stillhouse Hollow in pools and riffles as calculated using BVET techniques, summer 2004. The GWJNF DFC is between 35 and 65 percent of total stream area in pools.



LWD per kilometer in Stillhouse Hollow, summer 2004. Y-axis labels are LWD size classes described below. The GWJNF DFC for total LWD is between 78 and 186 pieces per km.

- Size 1: < 5 m long, 10-55 cm diameter
- Size 2: < 5 m long, > 55 cm diameter
- Size 3: > 5 m long, 10-55 cm diameter
- Size 4: > 5 m long, > 55 cm diameter

Stream features found on Stillhouse Hollow during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Stream Feature | Distance (m) | Width (m) | Comments |
|-----------------------|---------------------|------------------|-------------------------------------|
| SEEP | 19.2 | | OUT OF RIGHT BANK |
| OTHER | 38 | | LOW WATER |
| SIDE CHANNEL | 84.6 | | ON RIGHT |
| FORD | 159.6 | | TRAIL CROSSING |
| FORD | 198.2 | | TRAIL |
| UNDERGROUND | 208.3 | | FROM 49.8 m TO 208.3 m |
| UNDERGROUND | 215.5 | | FROM 209.9 m TO 215.5 m |
| SIDE CHANNEL | 648.9 | | IN ON RIGHT |
| FALL | 695.2 | | 0.5M HIGH |
| TRIBUTARY | 1188 | | IN ON RIGHT |
| LAND SLIDE | 1265.4 | | ON LEFT, STREAM EROSION |
| SIDE CHANNEL | 1484.3 | | IN ON RIGHT |
| LAND SLIDE | 1545 | | EROSION |
| UNDERGROUND | 1971.8 | | FROM 1924.6 m TO 1971.8 m |
| LAND SLIDE | 2082.3 | | BANK STEEP SLOPE AND STREAM EROSION |
| UNDERGROUND | 2175.9 | | FROM 2172.6 m TO 2175.9 m |
| TRIBUTARY | 2333.8 | 0.5 | IN ON LEFT' DRY |
| TRIBUTARY | 2508.3 | | ON RIGHT |
| SEEP | 2514.9 | | |
| UNDERGROUND | 2629.2 | | FROM 2617.2 m TO 2629.2 m |
| UNDERGROUND | 2657.5 | | FROM 2649.7 m TO 2657.5 m |
| UNDERGROUND | 2699 | | FROM 2693.6 m TO 2699 m |
| UNDERGROUND | 2742.2 | | FROM 2702.8 m TO 2742.2 m |
| UNDERGROUND | 2777.5 | | FROM 2749.1 m TO 2777.5 m |
| UNDERGROUND | 2789 | | FROM 2785.3 m TO 2789 m |

Stream crossings encountered on Stillhouse Hollow during BVET habitat inventory, summer 2004. Distance is number of meters from start of inventory. Culvert perch is distance from water surface to bottom of culvert. Natural substrate is whether there was natural substrate present throughout entire length of culvert.

Crossing type: None described

Distance (m):

Road number/trail name:

Culvert type:

Culvert outlets (n):

Culvert diameter (cm):

Culvert height (cm):

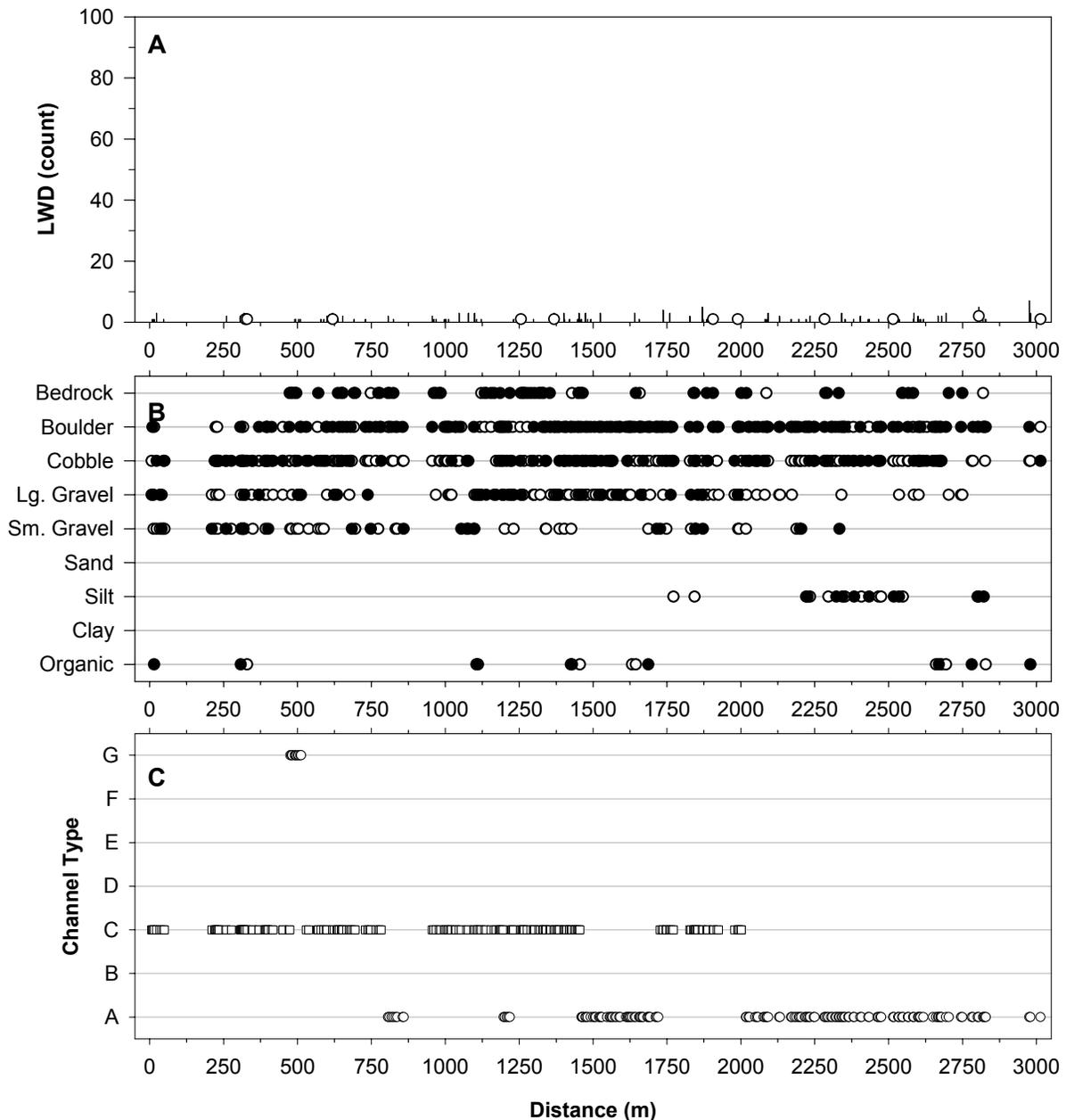
Culvert material:

Culvert perch (cm):

Substrate (y/n):

Photos (y/n):

Comments:



Distribution and abundance of LWD, distribution of substrates, and distribution of Rosgen's channel types (Rosgen 1996) in Stillhouse Hollow summer 2004. LWD, substrate, and channel type were recorded for each habitat unit in the stream. X-axis indicates distance upstream from confluence of Stillhouse Hollow and a side channel of North River west of Forest Service Road 95. Vertical bars on (A) indicate total count of LWD; open circles represent the amount of the total LWD that was >5 m in length, >55 cm in diameter (size 4). Closed circles on (B) are dominant substrates, open circles are subdominant substrates. See Appendix A for substrate sizes. See Appendix A for channel type descriptions from (C).

Photos taken on Stillhouse Hollow during BVET habitat survey, summer 2004. Distance is meters from start of survey.

| Unit Type | Unit Number | Distance (m) | Comments |
|------------------|--------------------|---------------------|--------------------------------------|
| POOL | 4 | 40.5 | |
| RIFFLE | 4 | 47.1 | |
| POOL | 9 | 229.9 | |
| RIFFLE | 9 | 276.3 | |
| POOL | 14 | 314.6 | |
| RIFFLE | 14 | 319.2 | SWITCHING TO EVERY TENTH SAMPLE |
| RIFFLE | 24 | 475.9 | ROSGEN G CHANNEL |
| POOL | 35 | 624 | |
| RIFFLE | 34 | 633.6 | |
| POOL | 45 | 782.9 | |
| RIFFLE | 44 | 806.5 | |
| RIFFLE | 54 | 1033.7 | |
| POOL | 55 | 1036 | POOL PIC WAS TAKEN BEFORE RIFFLE PIC |
| POOL | 65 | 1192.2 | |
| RIFFLE | 64 | 1195.8 | |
| GLIDE | 75 | 1289.3 | |
| RIFFLE | 74 | 1329.4 | |
| POOL | 85 | 1385.9 | |
| RIFFLE | 84 | 1436.7 | |
| POOL | 95 | 1476.9 | |
| RIFFLE | 94 | 1546.6 | ENDED SURVEY ON 6\16\04 AT 1745 |
| POOL | 105 | 1623.3 | |
| RIFFLE | 104 | 1683.9 | |
| POOL | 115 | 1720.1 | |
| RIFFLE | 114 | 1850.9 | |
| POOL | 125 | 1871.9 | |
| RIFFLE | 124 | 2048.2 | |
| POOL | 135 | 2057.8 | |
| POOL | 145 | 2220.3 | |
| CASCADE | 134 | 2291.3 | |
| POOL | 155 | 2352 | |
| RIFFLE | 144 | 2462.4 | |
| POOL | 165 | 2567.1 | |
| RIFFLE | 154 | 2649.7 | |

Appendix A:

Size classes used to categorize large woody debris during BVET habitat surveys on the Dry River Ranger District, summer 2004. Woody debris < 1.0 m in length or < 10 cm in diameter were omitted.

| Size Class | Length (m) | Diameter (cm) |
|------------|------------|---------------|
| 1 | < 5 | 10-55 |
| 2 | < 5 | > 55 |
| 3 | > 5 | 10-55 |
| 4 | > 5 | > 55 |

Size classes used to categorize substrate particles during BVET habitat surveys on the Dry River Ranger District, summer 2004. Size was visually estimated on the intermediate axis (b-axis).

| Size Class | Name | Size (mm) | Description |
|------------|--------------|----------------|---|
| 1 | Organic | -- | Dead organic matter, leaves, detritus, etc. |
| 2 | Clay | < 0.00024 | Sticky |
| 3 | Silt | 0.00024-0.0039 | Slippery |
| 4 | Sand | 0.0039-2 | Gritty |
| 5 | Small Gravel | 3-16 | Sand to thumbnail |
| 6 | Large Gravel | 17-64 | Thumbnail to fist |
| 7 | Cobble | 65-256 | Fist to head |
| 8 | Boulder | >256 | Larger than head |
| 9 | Bedrock | -- | Solid parent material |

Bankfull channel characteristics used to determine Rosgen channel types in the field during BVET habitat surveys on the Dry River Ranger District, summer 2004.

| Channel Type | A | B | C | D | E | F | G |
|--------------|---------|-----------|-------|------|-------|-------|---------|
| Entrenchment | < 1.4 | 1.4 – 2.2 | > 2.2 | n/a | > 2.2 | < 1.4 | < 1.4 |
| W/D Ratio | < 12 | > 12 | > 12 | > 40 | < 12 | > 12 | < 12 |
| Slope (%) | 4 – 9.9 | 2 – 3.9 | < 2 | < 4 | < 2 | < 2 | 2 – 3.9 |