Current Condition of Streams on the Mt. Rogers National Recreation Area,
George Washington - Jefferson National Forest, Virginia

Center for Aquatic Technology Transfer
134 Cheatham Hall
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061-0321
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United States Department of Agriculture
Forest Service
Center for Aquatic Technology Transfer

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Introduction - In Spring 1998 we began stream habitat surveys on the Mt. Rogers National Recreation Area (MRNRA), George Washington - Jefferson National Forest (GW - JNF) to quantify current stream conditions. Habitat in over 65 miles of stream (41 streams) was classified and inventoried between 30 May and 15 August 1998 using Basinwide Visual Estimation Techniques (BVET [Dolloff et. al 1993]).

We modified standard BVET methods to measure stream habitat parameters identified in the George Washington (GW) forest plan. Included in the forest plan is an outline of the desired-future-condition (DFC) for all the streams within the GW based on physical habitat. The pertinent DFCs for the GW include woody debris loading of 78 to 186 pieces per kilometer and 30 to 70 percent of the total stream habitat in pools. The use of BVET allowed us to estimate woody debris loading, percentage of pool and riffle area, and the width of the riparian area of streams in the MRNRA. Further, we were able to map the distribution of woody debris, and Rosgen's channel type in all streams surveyed.

The purpose of this report is to describe the current conditions of MRNRA streams in a format useful to the MRNRA and the GW-JNF. The enclosed information is intended as a baseline for MRNRA managers involved in habitat improvement projects or land use decisions.

Methods - Two-stage visual estimation techniques were used to quantify habitat and DFCs in selected MRNRA streams. During the first stage, all habitat units were classified and the surface area and depth were estimated. Sampling strata were based on naturally occurring habitat units such as pools (an area in the stream with low water velocity, streambed gradient less than zero, and a smooth water surface), riffles (an area in the stream with moderately steep gradient, shallow water, relatively high velocity, and turbulent surface), glides (an area in the stream with moderate to low water velocity, gradient at or near zero, and uniform depth), cascades (an area in the stream with very high velocity, turbulent surface, and steep gradient), and braids (an area in the stream where multiple channels occur regardless of habitat type). Surveys began at confluences for streams confined to the MRNRA and at the downstream USFS boundary for all other streams. Surveys were terminated when we encountered an upstream USFS property boundary or determined the stream to be intermittent.

Habitat in each stream was classified and inventoried by a two-person crew. One crew member identified each habitat unit by type, estimated surface area, estimated the average and maximum depth, and substrate composition for each habitat unit. This crew member also determined whether or not embeddedness (an area on the stream bottom where larger substratum was embedded by at least 35% or more of smaller substratum) was present in pools. Average depth of each habitat unit was estimated by taking depth measurements at various places across the channel profile with a graduated staff marked in 5cm increments. The length (0.1m) of each habitat unit was measured with a hip chain.

Another crew member classified and inventoried large woody debris (LWD) within the stream channel, and Rosgen's channel type associated with each habitat unit. This crew member also recorded the data on a Husky Hunter field computer.
LWD was divided into four classes: 1) less than 5m long, less than 55 cm in diameter, 2) less than 5m long, greater than 55cm in diameter, 3) greater than 5m long, less than 55cm in diameter, and 4) greater than 5m long, greater than 55cm in diameter. All LWD less than 1m long and less than 10cm in diameter were omitted from the survey. Rosgen’s channel types were restricted to A, B, C, D, and F (pers. comm. Gary Kappesser, GW-JNF Hydrologist). This was performed following the guidelines found in Rosgen, 1996.

The first unit of each habitat type selected for intensive sampling (accurate measurement of surface area - second stage sampling) was determined randomly. Additional units were selected systematically (one unit out of 10 for each habitat type). The width of these systematically selected habitat units was measured with a 30-m measuring tape at intervals ranging from about 1 m to 15 m. Interval size was determined by the length and the morphology of the unit (e.g., intervals of measured widths increased with increasing unit length).

The relationship between the estimated surface area and the measured surface area typically is strongly and positively correlated when the estimates are made by experienced personnel; thus, visual estimates were corrected by multiplying all estimates by a calibration ratio (Hankin and Reeves 1988). The calibration ratio (Q), the estimated true total area (M) and the variance of the area estimator V(M) were calculated separately for each habitat type and each stream.

In each of the systematically selected riffles we also estimated the stream channel width (m) at bankfull and riparian width (m) as described by Harrelson et. al 1994. We used this information to describe the channel and flood plain associated with each stream. Temperature (Celsius) and channel gradient (%) were also measured at different intervals in each stream.

BVET calculations were computed using a Statistical Analysis Systems (SAS) program developed by Dr. Patricia Flebbe (140 Cheatham Hall, VA Tech, Blacksburg, VA 24061-0321). Data were summarized using a Quattro Pro spreadsheet.

**User's Guide** - Stream Summaries are organized by U. S. Geological Survey Topographic Quadrangle. Two streams, White Top Laurel Creek and the South Fork Holston River, were divided into sections (i.e. upper, and lower). Data for each stream section were collected, analyzed, and presented separately. Glides and cascades were included with pools and riffles summaries respectively, unless otherwise specified (i.e. percent of pool habitat called as glide). Each stream or stream section summary contains: 1) synopsis of stream characteristics; 2) boxplots of maximum and average depth for pools and riffles, and average residual pool depth; 3) LWD size graph; 4) LWD distribution graph; 5) substrate composition for pools and riffles; 6) boxplot of riparian measurements; 7) percent pools and riffles graph; and 8) distribution of Rosgen’s channel type. GW-JNF DFCs are indicated on all pertinent graphs.

We also included references tables of all streams surveyed which will allow managers to quickly assess the present condition of MRNRA streams in relation to pertinent DFCs. Streams are arranged by DFC parameters (percent pool habitat and LWD pieces per kilometer) in descending order. DFCs are indicated within each table.
Literature Cited


Acknowledgments

We would like to thank the following people for their contributions to this report: Cecil Thomas, Tom Blevins, Mike Robertshaw, John Fuller, and Antoinette DiVittorio.
# Reference Tables

**Table 1.** Large woody debris (LWD) pieces per kilometer in streams on the Mt. Rogers National Recreation Area. Streams above the double line meet GW-JNF DFCs.

<table>
<thead>
<tr>
<th>Stream</th>
<th>LWD per kilometer</th>
<th>Kilometers Surveyed</th>
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</thead>
<tbody>
<tr>
<td>Staley Creek</td>
<td>619.3</td>
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<tr>
<td>Killenger Creek</td>
<td>557.1</td>
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<td>Star Hill Branch</td>
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<td>Green Cove Creek</td>
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<td>Henry Widener Branch</td>
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<tr>
<td>Buzzard Den Branch</td>
<td>442.4</td>
<td>1.7</td>
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### LWD > 78 pieces per kilometer

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<tr>
<td>Kinser Creek</td>
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<td>Dickey's Creek</td>
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<td>South Fork Holston River (Lower)</td>
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<td>Parks Creek</td>
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### Pool Habitat ≥ 30%

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<th>Kilometers Surveyed</th>
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<tr>
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<td>28</td>
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<td>Rush Creek</td>
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<td>Stream</td>
<td>Percent Pool Habitat</td>
<td>Kilometers Surveyed</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>East Fork Hopkins Branch</td>
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<td>Killenger Creek</td>
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<td>Feathercamp Branch</td>
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<td>1.4</td>
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<td>Dry Branch</td>
<td>15.3</td>
<td>1</td>
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<tr>
<td>Buzzard Den Branch</td>
<td>12.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Solomon Branch</td>
<td>7.8</td>
<td>0.8</td>
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</tbody>
</table>
Stream Summaries
Laurel Bloomery Quadrangle
Stream: London Bridge Branch
District: Mount Rogers National Recreation Area
Quadrangle: Laurel Bloomery
Sample Date: 06/02/98
Downstream Starting Point: Confluence with Beaver Dam Creek

Total Distance Surveyed: 0.8 kilometers
Percent of Total Area - Pools: 72.9%
Number of Pools: 29
Number of Pools per kilometer: 36.3
Total Pool Area: 2257.8 sq. meters
Mean Pool Area: 77.9 sq. meters
Correction Factor: 1.62
Mean Maximum Depth: 33.7 cm
Mean Average Depth: 18.4 cm
Mean Average Residual Pool Depth: 10.6 cm
Percent of Total Area - Riffles: 27.1%
Number of Riffles: 25
Number of Riffles per kilometer: 31.3
Total Riffle Area: 839.8 sq. meters
Mean Riffle Area: 33.6 sq. meters
Correction Factor: 1.02
Mean Maximum Depth: 18.4 cm
Mean Average Depth: 23.2 cm

Number of Large Woody Debris Pieces per kilometer: 250.4
Wood < 5 m and < 55 cm: 57.3
Wood < 5 m and > 55 cm: 7.5
Wood > 5 m and < 55 cm: 155.7
Wood > 5 m and > 55 cm: 29.9

Mean Channel Width: 5.5 m
Mean Riparian Width: 18.3 m
Mean Maximum Riparian Distance (either side): 10.2 m
Mean Minimum Riparian Distance (either side): 2.6 m
Maximum Riparian Width (Total): 22.7 m
Minimum Riparian Width (Total): 13.7 m
London Bridge Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 2.4%

Rosgen's Channel Type Frequency:

Channel Type A: 23.6%
Channel Type B: 61.8%
Channel Type C: 14.6%
Channel Type D:

Percent Pools with $\geq$ 35% Embeddedness: 27.6%

Average Channel Gradient: 14.0
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Distribution and Abundance of Large Woody Debris

Number of Pieces

Total LWD

London Bridge Branch

Distance (m)

LWD > 5 m > 55 cm
London Bridge Branch
Substrate Composition

Pools

Riffles
Riparian Width
Stream: London Bridge Branch
Number of Measurements: 2
Mean Width: 18.2m  Std Dev: 6.4
Max: 22.7m        Min: 13.7m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
London Bridge Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

- Pool Area: 72.9%
- Riffle Area: 27.1%

30% 70%
London Bridge Branch
Rosgen's Channel Type Distribution

[Graph showing channel types A, B, and C over distance (m)]
Stream: Ramsey Branch
District: Mount Rogers National Recreation Area
Quadrangle: Laurel Bloomery
Sample Date: 06/02/98

Downstream Starting Point: Forest Service Boundary

Total Distance Surveyed: 0.7 kilometers
  Percent of Total Area - Pools: 22.2%
  Number of Pools: 45
  Number of Pools per kilometer: 64.3
  Total Pool Area: 319.7 sq. meters ± 29.6
  Mean Pool Area: 7.1 sq. meters
  Correction Factor: 1.03
  Mean Maximum Depth: 31.7 cm
  Mean Average Depth: 23.0 cm
  Mean Average Residual Pool Depth: 15.5 cm

Percent of Total Area - Riffles: 77.8%
  Number of Riffles: 41
  Number of Riffles per kilometer: 58.6
  Total Riffle Area: 1118.6 sq. meters ± 579.9
  Mean Riffle Area: 27.3 sq. meters
  Correction Factor: 1.03
  Mean Maximum Depth: 18.3 cm
  Mean Average Depth: 9.8 cm

Number of Large Woody Debris Pieces per kilometer: 149.3
  Wood < 5 m and < 55 cm: 106.2
  Wood < 5 m and > 55 cm: 3.1
  Wood > 5 m and < 55 cm: 38.5
  Wood > 5 m and > 55 cm: 1.5

Mean Channel Width: 3.6 m

Mean Riparian Width: 13.0 m
  Mean Maximum Riparian Distance (either side): 6.1 m
  Mean Minimum Riparian Distance (either side): 3.3 m
  Maximum Riparian Width (Total): 17.3 m
  Minimum Riparian Width (Total): 10.4 m
Ramsey Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 3.7%

Rosgen’s Channel Type Frequency:
  - Channel Type A: 17.5%
  - Channel Type B: 76.7%
  - Channel Type C: 5.8%
  - Channel Type D:

Percent Pools with > 35% Embeddedness: 35.6%

Average Channel Gradient: 8.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Ramsey Branch

Number of Pieces per Kilometer

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>149.3</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>1.5</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>38.5</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>3.1</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>106.2</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Ramsey Branch

Distance (m)

Number of Pieces

Total LWD

LWD > 5 m > 55 cm
Riparian Width
Stream: Ramsey Branch
Number of Measurements: 4
Mean Width: 13.0m  Std Dev: 3.1
Max: 17.3m      Min: 10.4m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Ramsey Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area
22.2%

Riffle Area
77.8%

30%

70%
Ramsey Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Damascus and Konnarock Quadrangles
Stream: Beech Creek
District: Mount Rogers National Recreation Area
Quadrangle: Damascus/Konnarock
Sample Date: 06/03/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 1.6 kilometers

Percent of Total Area - Pools: 16.6%
Number of Pools: 60
Number of Pools per kilometer: 36.8
Total Pool Area: 570.8 sq. meters + 117.3
Mean Pool Area: 9.5 sq. meters
Correction Factor: 1.05
Mean Maximum Depth: 31.2 cm
Mean Average Depth: 17.3 cm
Mean Average Residual Pool Depth: 10.2 cm
Percent of Total Area - Riffles: 83.4%
Number of Riffles: 57
Number of Riffles per kilometer: 35.0
Total Riffle Area: 2667.2 sq. meters + 701.5
Mean Riffle Area: 50.3 sq. meters
Correction Factor: 1.18
Mean Maximum Depth: 16.8 cm
Mean Average Depth: 9.0 cm

Number of Large Woody Debris Pieces per kilometer: 379.5
Wood < 5 m and < 55 cm: 138.3
Wood < 5 m and > 55 cm: 28.2
Wood > 5 m and < 55 cm: 163.4
Wood > 5 m and > 55 cm: 49.6

Mean Channel Width: 3.2 m
Mean Riparian Width: 12.1 m
Mean Maximum Riparian Distance (either side): 5.9 m
Mean Minimum Riparian Distance (either side): 3.0 m
Maximum Riparian Width (Total): 18.3 m
Minimum Riparian Width (Total): 8.3 m
Beech Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 2.8%

Rosgen's Channel Type Frequency:

Channel Type A: 61.0%
Channel Type B: 25.0%
Channel Type C: 14.0%
Channel Type D:

Percent Pools with > 35% Embeddedness: 48.3%

Average Channel Gradient: N/A
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Beech Creek

Large Woody Debris

<table>
<thead>
<tr>
<th>Size Range</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>48.6</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>163.4</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>28.2</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>136.3</td>
</tr>
</tbody>
</table>

Total: 379.5
Distribution and Abundance of Large Woody Debris

Total LWD

Beech Creek

LWD > 5 m > 55 cm
Riparian Width
Stream: Beech Creek
Number of Measurements: 5
Mean Width: 12.1m   Std Dev: 3.9
Max: 18.3m   Min: 8.3m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Beech Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area
16.6%

Riffle Area
83.4%

30%

70%
Beech Creek
Rosgen's Channel Type Distribution
Stream: Buzzard Den Branch
District: Mount Rogers National Recreation Area
Quadrangle: Konnarock
Sample Date: 06/17/98

Downstream Starting Point: Forest Service Boundary

Total Distance Surveyed: 1.7 kilometers

Percent of Total Area - Pools: 12.4%
Number of Pools: 75
Number of Pools per kilometer: 44.7
Total Pool Area: 462.0 sq. meters + 44.4
Mean Pool Area: 6.2 sq. meters
Correction Factor: 1.02
Mean Maximum Depth: 36.8 cm
Mean Average Depth: 24.9 cm
Mean Average Residual Pool Depth: 17.7 cm

Percent of Total Area - Riffles: 87.6%
Number of Riffles: 66
Number of Riffles per kilometer: 39.4
Total Riffle Area: 3250.5 sq. meters + 275.8
Mean Riffle Area: 49.3 sq. meters
Correction Factor: 1.02
Mean Maximum Depth: 22.6 cm
Mean Average Depth: 11.1 cm

Number of Large Woody Debris Pieces per kilometer: 442.4
Wood < 5 m and < 55 cm: 256.4
Wood < 5 m and > 55 cm: 26.2
Wood > 5 m and < 55 cm: 142.5
Wood > 5 m and > 55 cm: 17.3

Mean Channel Width: 3.6 m
Mean Riparian Width: 11.8 m
Mean Maximum Riparian Distance (either side): 6.5 m
Mean Minimum Riparian Distance (either side): 1.7 m
Maximum Riparian Width (Total): 23.5 m
Minimum Riparian Width (Total): 5.6 m
Buzzard Den Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 21.6%

Rosgen's Channel Type Frequency:
  Channel Type A: 88.4%
  Channel Type B: 11.6%
  Channel Type C:
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 41.3%

Average Channel Gradient: 16.0
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Buzzard Den Branch

Large Woody Debris

Number of Pieces per Kilometer

<table>
<thead>
<tr>
<th>Range</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>17.3</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>142.5</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>26.2</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>255.4</td>
</tr>
<tr>
<td>Total</td>
<td>442.4</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Total LWD

Buzzard Den Branch

LWD > 5 m > 55 cm

Number of Pieces

Distance (m)
Riparian Width
Stream: Buzzard Den Branch
Number of Measurements: 9
Mean Width: 11.8m  Std Dev: 5.2
Max: 23.5m  Min: 5.6m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Buzzard Den Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Buzzard Den Branch
Rosgen's Channel Type Distribution
Stream: Dry Branch
District: Mount Rogers National Recreation Area
Quadrangle: Konnarock
Sample Date: 06/16/98
Downstream Starting Point: Forest Service Boundary along State Rt. 606
Total Distance Surveyed: 1.0 kilometers
Percent of Total Area - Pools: 15.3%
Number of Pools: 37
Number of Pools per kilometer: 37
Total Pool Area: 335.0 sq. meters ± 26.0
Mean Pool Area: 9.1 sq. meters
Correction Factor: 1.26
Mean Maximum Depth: 40.8 cm
Mean Average Depth: 32.8 cm
Mean Average Residual Pool Depth: 20.5 cm
Percent of Total Area - Riffles: 84.7%
Number of Riffles: 37
Number of Riffles per kilometer: 37
Total Riffle Area: 1847.9 sq. meters ± 222.1
Mean Riffle Area: 49.9 sq. meters
Correction Factor: 0.99
Mean Maximum Depth: 24.3 cm
Mean Average Depth: 13.2 cm
Number of Large Woody Debris Pieces per kilometer: 282.6
Wood < 5 m and < 55 cm: 141.8
Wood < 5 m and > 55 cm: 23.3
Wood > 5 m and < 55 cm: 100.0
Wood > 5 m and > 55 cm: 17.5
Mean Channel Width: 3.4 m
Mean Riparian Width: 14.3 m
Mean Maximum Riparian Distance (either side): 9.7 m
Mean Minimum Riparian Distance (either side): 1.2 m
Maximum Riparian Width (Total): 28.3 m
Minimum Riparian Width (Total): 3.3 m
Dry Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 0.0%

Rosgen's Channel Type Frequency:
  Channel Type A: 55.0%
  Channel Type B: 45.0%
  Channel Type C:
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 32.4%

Average Channel Gradient: 10.2
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Dry Branch

Total: 282.6

> 5 m > 55 cm: 17.5

> 5 m < 55 cm: 100.0

< 5 m > 55 cm: 23.3

< 5 m < 55 cm: 141.8

Number of Pieces per Kilometer
Riparian Width
Stream: Dry Branch
Number of Measurements: 6
Mean Width: 14.3m  Std Dev: 10.0
Max: 28.3m  Min: 3.3m

Dry Branch

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Dry Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Dry Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Feathercamp Branch
District: Mount Rogers National Recreation Area
Quadrangle: Konnarock
Sample Date: 06/03/98
Downstream Starting Point: Confluence with Straight Branch
Total Distance Surveyed: 2.5 kilometers
  Percent of Total Area - Pools: 17.4%
  Number of Pools: 137
  Number of Pools per kilometer: 54.8
  Total Pool Area: 1079.3 sq. meters + 178.7
  Mean Pool Area: 7.9 sq. meters
  Correction Factor: 1.16
  Mean Maximum Depth: 41.4 cm
  Mean Average Depth: 31.8 cm
  Mean Average Residual Pool Depth: 25.9 cm
Percent of Total Area - Riffles: 82.6%
  Number of Riffles: 123
  Number of Riffles per kilometer: 49.2
  Total Riffle Area: 5107.6 sq. meters + 364.5
  Mean Riffle Area: 41.5 sq. meters
  Correction Factor: 1.12
  Mean Maximum Depth: 24.9 cm
  Mean Average Depth: 13.5 cm
Number of Large Woody Debris Pieces per kilometer: 150.4
  Wood < 5 m and < 55 cm: 120.8
  Wood < 5 m and > 55 cm: 6.8
  Wood > 5 m and < 55 cm: 22.0
  Wood > 5 m and > 55 cm: 0.8
Mean Channel Width: 1.9 m
Mean Riparian Width: 9.6 m
  Mean Maximum Riparian Distance (either side): 5.1 m
  Mean Minimum Riparian Distance (either side): 2.6 m
  Maximum Riparian Width (Total): 14.0 m
  Minimum Riparian Width (Total): 7.7 m
Feathercamp Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 25.9%

Rosgen's Channel Type Frequency:
  Channel Type A: 65.2%
  Channel Type B: 33.7%
  Channel Type C: 1.1%
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 8.0%

Average Channel Gradient: 13.0
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Feathercamp Branch
Substrate Composition

Pools

Riffles

Frequency (%) vs. Cumulative Percent

Dominant
Subdominant

Organic  Clay  Silt  Sand  Sm. Gravel  Lg. Gravel  Cobble  Boulder  Bedrock
Riparian Width
Stream: Feathercamp Branch
Number of Measurements: 6
Mean Width: 9.6m  Std Dev: 2.5
Max: 14.0m   Min: 7.7m

Feathercamp Branch

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Feathercamp Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

Pool Area 17.4%
Riffle Area 82.6%

30% 70%
Feathercamp Branch
Rosgen's Channel Type Distribution

Distance (m)
Stream: Green Cove Creek
District: Mount Rogers National Recreation Area
Quadrangle: Konnarock
Sample Date: 06/09/98
Downstream Starting Point: Confluence with Whitetop Laurel Creek
Total Distance Surveyed: 3.1 kilometers

Percent of Total Area - Pools: 19.9%
Number of Pools: 67
Number of Pools per kilometer: 21.6
Total Pool Area: 4681.9 sq. meters ± 217.7
Mean Pool Area: 69.9 sq. meters
Correction Factor: 0.86
Mean Maximum Depth: 97.9 cm
Mean Average Depth: 71.6 cm
Mean Average Residual Pool Depth: 40.2 cm

Percent of Total Area - Riffles: 80.1%
Number of Riffles: 54
Number of Riffles per kilometer: 17.4
Total Riffle Area: 18798.8 sq. meters ± 2318.4
Mean Riffle Area: 348.1 sq. meters
Correction Factor: 1.11
Mean Maximum Depth: 85.3 cm
Mean Average Depth: 39.3 cm

Number of Large Woody Debris Pieces per kilometer: 497.8
Wood < 5 m and < 55 cm: 276.7
Wood < 5 m and > 55 cm: 9.9
Wood > 5 m and < 55 cm: 194.3
Wood > 5 m and > 55 cm: 16.9

Mean Channel Width: 11.9 m
Mean Riparian Width: 43.8 m

Mean Maximum Riparian Distance (either side): 29.0 m
Mean Minimum Riparian Distance (either side): 2.9 m
Maximum Riparian Width (Total): 125.6 m
Minimum Riparian Width (Total): 16.5 m
Green Cove Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 17.0%

Rosgen's Channel Type Frequency:

Channel Type A: 59.7%
Channel Type B: 28.8%
Channel Type C: 11.5%
Channel Type D:

Percent Pools with > 35% Embeddedness: 19.4%

Average Channel Gradient: 7.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Green Cove Creek

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>497.8</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>16.9</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>194.3</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>9.9</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>276.7</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Green Cove Creek

Number of Pieces

Distance (m)

Total LWD

LWD > 5 m ≥ 55 cm
Green Cove Creek
Substrate Composition

**Pools**

- **Frequency (%)**
- **Cumulative Percent**

- **Organic**
- **Clay**
- **Silt**
- **Sand**
- **Sm. Gravel**
- **Lg. Gravel**
- **Cobble**
- **Boulder**
- **Bectrock**

**Riffles**

- **Frequency (%)**
- **Cumulative Percent**

- **Organic**
- **Clay**
- **Silt**
- **Sand**
- **Sm. Gravel**
- **Lg. Gravel**
- **Cobble**
- **Boulder**
- **Bectrock**

Legend:
- **Dominant**
- **Subdominant**
- **Dominant**
- **Subdominant**
Riparian Width
Stream: Green Cove Creek
Number of Measurements: 5
Mean Width: 43.7m  Std Dev: 46.0
Max: 125.6m   Min: 16.5m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Green Cove Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area
19.9%

Riffle Area
80.1%

30%
70%
Green Cove Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Henry Widener Branch
District: Mount Rogers National Recreation Area
Quadrangle: Konnarock
Sample Date: 06/17/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 0.5 kilometers

Percent of Total Area - Pools: 21.2%
Number of Pools: 22
Number of Pools per kilometer: 44
Total Pool Area: 284.0 sq. meters ± 71.0
Mean Pool Area: 12.9 sq. meters
Correction Factor: 1.21
Mean Maximum Depth: 37.7 cm
Mean Average Depth: 27.5 cm
Mean Average Residual Pool Depth: 17.5 cm

Percent of Total Area - Riffles: 78.8%
Number of Riffles: 21
Number of Riffles per kilometer: 42.0
Total Riffle Area: 1055.2 sq. meters ± 132.2
Mean Riffle Area: 50.2 sq. meters
Correction Factor: 1.01
Mean Maximum Depth: 22.6 cm
Mean Average Depth: 12.1 cm

Number of Large Woody Debris Pieces per kilometer: 450.0
Wood < 5 m and < 55 cm: 263.2
Wood < 5 m and > 55 cm: 23.4
Wood > 5 m and < 55 cm: 142.2
Wood > 5 m and > 55 cm: 21.2

Mean Channel Width: 4.7 m
Mean Riparian Width: 10.5 m
Mean Maximum Riparian Distance (either side): 4.3 m
Mean Minimum Riparian Distance (either side): 1.5 m
Maximum Riparian Width (Total): 14.0 m
Minimum Riparian Width (Total): 6.6 m
Henry Widener Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 38.1%

Rosgen's Channel Type Frequency:
  - Channel Type A: 60.0%
  - Channel Type B: 40.0%
  - Channel Type C:
  - Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 27.3%

Average Channel Gradient: 6.0
Henry Widener Branch

Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Henry Widener Branch

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>450.0</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>21.2</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>142.2</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>23.3</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>263.2</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Henry Widener Branch

Number of Pieces

Distance (m)

LWD > 5 m > 55 cm
Henry Widener Branch
Substrate Composition

Pools

Riffles
Riparian Width
Stream: Henry Widener Branch
Number of Measurements: 4
Mean Width: 10.5m   Std Dev: 3.3
Max: 14.0m   Min: 6.6m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Henry Widener Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

Pool Area
21.2%

Riffle Area
78.8%

70%
30%
Henry Widener Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)

A

B

C
Stream: Rush Creek
District: Mount Rogers National Recreation Area
Quadrangle: Konnarock
Sample Date: 06/23/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 2.8 kilometers
  Percent of Total Area - Pools: 26.4%
  Number of Pools: 124
  Number of Pools per kilometer: 44.3
  Total Pool Area: 2806.3 sq. meters + 199.3
  Mean Pool Area: 22.6 sq. meters
  Correction Factor: 0.97
  Mean Maximum Depth: 42.0 cm
  Mean Average Depth: 27.5 cm
  Mean Average Residual Pool Depth: 12.5 cm
Percent of Total Area - Riffles: 73.6%
  Number of Riffles: 97
  Number of Riffles per kilometer: 34.6
  Total Riffle Area: 7808.7 sq. meters + 2953.9
  Mean Riffle Area: 80.5 sq. meters
  Correction Factor: 1.02
  Mean Maximum Depth: 35.5 cm
  Mean Average Depth: 19.4 cm
Number of Large Woody Debris Pieces per kilometer: 166.4
  Wood < 5 m and < 55 cm: 107.3
  Wood < 5 m and > 55 cm: 11.3
  Wood > 5 m and < 55 cm: 37.2
  Wood > 5 m and > 55 cm: 10.6
Mean Channel Width: 5.2 m
Mean Riparian Width: 13.4 m
  Mean Maximum Riparian Distance (either side): 6.6 m
  Mean Minimum Riparian Distance (either side): 1.6 m
  Maximum Riparian Width (Total): 16.3 m
  Minimum Riparian Width (Total): 10.9 m
Rush Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 48.7%

Rosgen's Channel Type Frequency:
  Channel Type A: 76.8%
  Channel Type B: 15.3%
  Channel Type C: 7.9%
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 41.9%

Average Channel Gradient: 12.0
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Rush Creek

Number of Pieces per Kilometer

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>107.3</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>37.2</td>
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</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>10.6</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>10.6</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Number of Pieces

Distance (m)

Total LWD

Rush Creek

LWD > 5 m > 55 cm
Rush Creek
Substrate Composition

Pools

Riffles
Riparian Width
Stream: Rush Creek
Number of Measurements: 5
Mean Width: 13.4m  Std Dev: 2.6
Max: 16.3m  Min: 10.9m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Rush Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Rush Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)

0  500  1000  1500  2000  2500  3000
Stream: Star Hill Branch
District: Mount Rogers National Recreation Area
Quadrangle: Konnarock
Sample Date: 06/04/98

Downstream Starting Point: Confluence with Green Cove Creek (Creeper Bridge # 42)

Total Distance Surveyed: 2.0 kilometers

Percent of Total Area - Pools: 35.8%
Number of Pools: 93
Number of Pools per kilometer: 46.5
Total Pool Area: 1712.2 sq. meters + 197.2
Mean Pool Area: 18.4 sq. meters
Correction Factor: 1.03
Mean Maximum Depth: 41.2 cm
Mean Average Depth: 31.1 cm
Mean Average Residual Pool Depth: 23.0 cm

Percent of Total Area - Riffles: 64.2%
Number of Riffles: 79
Number of Riffles per kilometer: 39.5
Total Riffle Area: 3071.6 sq. meters + 1066.9
Mean Riffle Area: 38.9 sq. meters
Correction Factor: 0.86
Mean Maximum Depth: 23.4 cm
Mean Average Depth: 13.1 cm

Number of Large Woody Debris Pieces per kilometer: 555.5
Wood < 5 m and < 55 cm: 334.7
Wood < 5 m and > 55 cm: 19.6
Wood > 5 m and < 55 cm: 187.0
Wood > 5 m and > 55 cm: 14.2

Mean Channel Width: 3.2 m

Mean Riparian Width: 30.4 m
Mean Maximum Riparian Distance (either side): 23.8 m
Mean Minimum Riparian Distance (either side): 3.4 m
Maximum Riparian Width (Total): 73.6 m
Minimum Riparian Width (Total): 5.2 m
Star Hill Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 26.0%

Rosgen's Channel Type Frequency:
- Channel Type A: 36.6%
- Channel Type B: 20.2%
- Channel Type C: 43.2%
- Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 60.2%

Average Channel Gradient: 3.3
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Star Hill Branch

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>556.5</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>14.2</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>187.0</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>19.6</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>334.7</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Star Hill Branch

Number of Pieces

Distance (m)

Total LWD

LWD > 5 m > 55 cm
Riparian Width
Stream: Star Hill Branch
Number of Measurements: 6
Mean Width: 30.4m  Std Dev: 25.0
Max: 73.6m     Min: 5.2m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Star Hill Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area 35.8%

Riffle Area 64.2%

30% 70%
Star Hill Branch
Rosgen's Channel Type Distribution
Stream: Straight Branch
District: Mount Rogers National Recreation Area
Quadrangle: Konnarock
Sample Date: 06/08/98
Downstream Starting Point: Confluence with Whitetop Laurel Creek
Total Distance Surveyed: 13.7 kilometers
  Percent of Total Area - Pools: 39.5%
  Number of Pools: 368
  Number of Pools per kilometer: 26.9
  Total Pool Area: 23405.4 sq. meters ± 734.4
  Mean Pool Area: 63.6 sq. meters
  Correction Factor: 0.96
  Mean Maximum Depth: 56.8 cm
  Mean Average Depth: 34.3 cm
  Mean Average Residual Pool Depth: 18.3 cm
  Percent of Total Area - Riffles: 60.5%
  Number of Riffles: 242
  Number of Riffles per kilometer: 17.7
  Total Riffle Area: 35844.5 sq. meters ± 5471.1
  Mean Riffle Area: 148.1 sq. meters
  Correction Factor: 1.07
  Mean Maximum Depth: 41.0 cm
  Mean Average Depth: 22.6 cm
Number of Large Woody Debris Pieces per kilometer: 200.7
  Wood < 5 m and < 55 cm: 136.5
  Wood < 5 m and > 55 cm: 9.5
  Wood > 5 m and < 55 cm: 51.9
  Wood > 5 m and > 55 cm: 2.8
Mean Channel Width: 7.9 m
Mean Riparian Width: 36.8 m
  Mean Maximum Riparian Distance (either side): 26.0 m
  Mean Minimum Riparian Distance (either side): 2.9 m
  Maximum Riparian Width (Total): 117.1 m
  Minimum Riparian Width (Total): 12.9 m
Straight Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 60.7%

Rosgen's Channel Type Frequency:
  Channel Type A:
  Channel Type B: 40.1%
  Channel Type C: 59.9%
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 46.2%

Average Channel Gradient: 5.2
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Straight Branch

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>200.7</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>2.8</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>61.9</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>9.5</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>136.5</td>
</tr>
</tbody>
</table>
Riparian Width
Stream: Straight Branch
Number of Measurements: 10
Mean Width: 36.8m  Std Dev: 32.1
Max: 117.1m  Min: 12.9m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Straight Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat
Straight Branch
Rogens's Channel Type Distribution
Stream: Whitetop Laurel Creek (Lower)
District: Mount Rogers National Recreation Area
Quadrangle: Damascus/Konnarock
Sample Date: 08/03/98
Downstream Starting Point: Forest Service Boundary (Damascus)
Total Distance Surveyed: 7.8 kilometers
   Percent of Total Area - Pools: 37.6%
   Number of Pools: 109
   Number of Pools per kilometer: 13.9
   Total Pool Area: 34171.2 sq. meters + 5175.7
   Mean Pool Area: 313.5 sq. meters
   Correction Factor: 0.91
   Mean Maximum Depth: 102.4 cm
   Mean Average Depth: 59.4 cm
   Mean Average Residual Pool Depth: 38.2 cm
   Percent of Total Area - Riffles: 62.4%
   Number of Riffles: 69
   Number of Riffles per kilometer: 8.8
   Total Riffle Area: 56766.0 sq. meters + 31233.7
   Mean Riffle Area: 822.7 sq. meters
   Correction Factor: 1.12
   Mean Maximum Depth: 62.8 cm
   Mean Average Depth: 31.6 cm
Number of Large Woody Debris Pieces per kilometer: 156.0
   Wood < 5 m and < 55 cm: 97.5
   Wood < 5 m and > 55 cm: 2.0
   Wood > 5 m and < 55 cm: 51.5
   Wood > 5 m and > 55 cm: 5.0
Mean Channel Width: 20.4 m
Mean Riparian Width: 66.1 m
   Mean Maximum Riparian Distance (either side): 39.4 m
   Mean Minimum Riparian Distance (either side): 6.3 m
   Maximum Riparian Width (Total): 110.0 m
   Minimum Riparian Width (Total): 25.5 m
Whitetop Laurel Creek (Lower) Continued.

Percent of Pool Habitat Surveyed as Glides: 26.5%

Rosgen's Channel Type Frequency:
  - Channel Type A: 1.5%
  - Channel Type B: 25.0%
  - Channel Type C: 73.5%
  - Channel Type D:

Percent Pools with > 35% Embeddedness: 29.4%

Average Channel Gradient: 3.0
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Whitetop Laurel Creek (Lower)

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>156.0</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>5.0</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>51.5</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>2.0</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>97.5</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Whitetop Laurel Creek (Lower)

Number of Pieces

LWD > 5 m > 55 cm

Distance (m)
Riparian Width
Stream: Whitetop Laurel Creek (Lower)
Number of Measurements: 4
Mean Width: 66.1m  Std Dev: 37.0
Max: 110.0m  Min: 25.5m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Whitetop Laurel Creek (Lower)  
Pool:Riffle Ratio  
DFC: 30 - 70% of the Stream Area in Pool Habitat
Whitetop Laurel Creek (Lower)
Rosgen's Channel Type Distribution
Stream: Whitetop Laurel Creek (Upper)
District: Mount Rogers National Recreation Area
Quadrangle: Konnarock
Sample Date: 08/03/98
Downstream Starting Point: Forest Service Boundary (Taylors Valley)
Total Distance Surveyed: 8.0 kilometers

Percent of Total Area - Pools: 39.7%
Number of Pools: 146
Number of Pools per kilometer: 18.25
Total Pool Area: 37045.8 sq. meters + 2537.7
Mean Pool Area: 253.7 sq. meters
Correction Factor: 1.03
Mean Maximum Depth: 84.3 cm
Mean Average Depth: 55.4 cm
Mean Average Residual Pool Depth: 30.9 cm

Percent of Total Area - Riffles: 60.3%
Number of Riffles: 106
Number of Riffles per kilometer: 13.3
Total Riffle Area: 56208.2 sq. meters + 6421.9
Mean Riffle Area: 530.3 sq. meters
Correction Factor: 1.14
Mean Maximum Depth: 45.9 cm
Mean Average Depth: 29.7 cm

Number of Large Woody Debris Pieces per kilometer: 427.5
Wood < 5 m and < 55 cm: 245.7
Wood < 5 m and > 55 cm: 4.9
Wood > 5 m and < 55 cm: 157.6
Wood > 5 m and > 55 cm: 19.3

Mean Channel Width: 15.7 m
Mean Riparian Width: 43.3 m

Mean Maximum Riparian Distance (either side): 23.6 m
Mean Minimum Riparian Distance (either side): 4.0 m
Maximum Riparian Width (Total): 74.7 m
Minimum Riparian Width (Total): 23.0 m
Whitetop Laurel Creek Creek (Upper) Continued.

Percent of Pool Habitat Surveyed as Glides: 22.3%

Rosgen's Channel Type Frequency:
  Channel Type A: 19.2%
  Channel Type B: 62.4%
  Channel Type C: 18.4%
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 19.2%

Average Channel Gradient: 5.0
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Whitetop Laurel Creek (Upper)

Large Woody Debris

- Total: 427.5
- > 5 m > 55 cm: 19.3
- > 5 m < 55 cm: 157.5
- < 5 m > 55 cm: 4.9
- < 5 m < 55 cm: 245.7

Number of Pieces per Kilometer
Riparian Width
Stream: Whitetop Laurel Creek (Upper)
Number of Measurements: 6
Mean Width: 43.3m  Std Dev: 23.8
Max: 74.7m    Min: 23.0m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Whitetop Laurel Creek (Upper)
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Whitetop Laurel Creek (Upper)
Rosgen's Channel Type Distribution

```
C
B
A

Distance (m)
```
Whitetop Mtn. Quadrangle
Stream: Barton Branch
District: Mount Rogers National Recreation Area
Quadrangle: Whitetop Mtn.
Sample Date: 06/30/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 1.2 kilometers
  Percent of Total Area - Pools: 36.4%
  Number of Pools: 83
  Number of Pools per kilometer: 69.8
  Total Pool Area: 720.2 sq. meters + 66.7
  Mean Pool Area: 8.7 sq. meters
  Correction Factor: 1.09
  Mean Maximum Depth: 26.9 cm
  Mean Average Depth: 17.2 cm
  Mean Average Residual Pool Depth: 14.4 cm
  Percent of Total Area - Riffles: 63.6%
  Number of Riffles: 48
  Number of Riffles per kilometer: 40.4
  Total Riffle Area: 1258.1 sq. meters + 174.1
  Mean Riffle Area: 26.2 sq. meters
  Correction Factor: 1.16
  Mean Maximum Depth: 15.8 cm
  Mean Average Depth: 8.4 cm
Number of Large Woody Debris Pieces per kilometer: 413.0
  Wood < 5 m and < 55 cm: 256.3
  Wood < 5 m and > 55 cm: 13.1
  Wood > 5 m and < 55 cm: 127.3
  Wood > 5 m and > 55 cm: 16.3
Mean Channel Width: 4.3 m
Mean Riparian Width: 10.0 m
  Mean Maximum Riparian Distance (either side): 4.8 m
  Mean Minimum Riparian Distance (either side): 0.9 m
  Maximum Riparian Width (Total): 12.8 m
  Minimum Riparian Width (Total): 8.3 m
Barton Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 48.0%

Rosgen's Channel Type Frequency:
  - Channel Type A: 45.7%
  - Channel Type B: 54.3%
  - Channel Type C:
  - Channel Type D:

Percent Pools with > 35% Embeddedness: 65.1%

Average Channel Gradient: 8.5
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Distribution and Abundance of Large Woody Debris

Number of Pieces

Total LWD

Barton Branch

LWD > 5 m > 55 cm

Distance (m)
Riparian Width
Stream: Barton Branch
Number of Measurements: 4
Mean Width: 10.0m  Std Dev: 1.9
Max: 12.8m  Min: 8.3m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Barton Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

Pool Area
36.4%

Riffle Area
63.6%
Barton Branch
Rosgen's Channel Type Distribution

Distance (m)
Stream: Cabin Creek
District: Mount Rogers National Recreation Area
Quadrangle: Whitetop Mtn.
Sample Date: 07/08/98
Downstream Starting Point: Forest Service and State Park Boundary
Total Distance Surveyed: 0.5 kilometers
   Percent of Total Area - Pools: 27.5%
   Number of Pools: 26
   Number of Pools per kilometer: 52
   Total Pool Area: 306.4 sq. meters + 19.8
   Mean Pool Area: 11.8 sq. meters
   Correction Factor: 1.02
   Mean Maximum Depth: 43.1 cm
   Mean Average Depth: 32.3 cm
   Mean Average Residual Pool Depth: 14.0 cm
   Percent of Total Area - Riffles: 72.5%
   Number of Riffles: 22
   Number of Riffles per kilometer: 44
   Total Riffle Area: 806.7 sq. meters + 170.6
   Mean Riffle Area: 36.7 sq. meters
   Correction Factor: 0.98
   Mean Maximum Depth: 29.3 cm
   Mean Average Depth: 16.1 cm
Number of Large Woody Debris Pieces per kilometer: 86.2
   Wood < 5 m and < 55 cm: 57.5
   Wood < 5 m and > 55 cm: 0.0
   Wood > 5 m and < 55 cm: 22.1
   Wood > 5 m and > 55 cm: 6.6
Mean Channel Width: 5.2 m
Mean Riparian Width: 14.8 m
   Mean Maximum Riparian Distance (either side): 2.4 m
   Mean Minimum Riparian Distance (either side): 7.2 m
   Maximum Riparian Width (Total): 21.2 m
   Minimum Riparian Width (Total): 9.6 m
Cabin Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 15.5%

Rosgen's Channel Type Frequency:
  Channel Type A: 71.2%
  Channel Type B: 25.0%
  Channel Type C: 3.8%
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 30.8%

Average Channel Gradient: 13.3
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Cabin Creek

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>86.2</td>
</tr>
<tr>
<td>&gt; 5m &gt; 55 cm</td>
<td>6.6</td>
</tr>
<tr>
<td>&gt; 5m &lt; 55 cm</td>
<td>22.1</td>
</tr>
<tr>
<td>&lt; 5m &gt; 55 cm</td>
<td>0.0</td>
</tr>
<tr>
<td>&lt; 5m &lt; 55 cm</td>
<td>57.4</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Cabin Creek

Distance (m)

Number of Pieces

Total LWD

LWD > 5 m > 55 cm
Cabin Creek
Substrate Composition

Pools

Riffles
Riparian Width
Stream: Cabin Creek
Number of Measurements: 3
Mean Width: 14.8m  Std Dev: 5.9
Max: 21.2m       Min:  9.6m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Cabin Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area
27.5%

Riffle Area
72.5%

30%

70%
Cabin Creek
Rosgen's Channel Type Distribution
Stream: Dell's Branch
District: Mount Rogers National Recreation Area
Quadrangle: Whitetop Mtn.
Sample Date: 07/06/98
Downstream Starting Point: Forest Service Boundary; Junction State Rt. 603 and Rt.600
Total Distance Surveyed: 0.6 kilometers
  Percent of Total Area - Pools: 21.4%
  Number of Pools: 24
  Number of Pools per kilometer: 40
  Total Pool Area: 266.1 sq. meters ± 41.2
  Mean Pool Area: 11.1 sq. meters
  Correction Factor: 1.00
  Mean Maximum Depth: 29.2 cm
  Mean Average Depth: 20.1 cm
  Mean Average Residual Pool Depth: 13.6 cm
Percent of Total Area - Riffles: 78.6%
  Number of Riffles: 20
  Number of Riffles per kilometer: 33.3
  Total Riffle Area: 975.4 sq. meters ± 92.9
  Mean Riffle Area: 48.8 sq. meters
  Correction Factor: 1.10
  Mean Maximum Depth: 19.8 cm
  Mean Average Depth: 11.0 cm

Number of Large Woody Debris Pieces per kilometer: 408.5
  Wood < 5 m and < 55 cm: 222.9
  Wood < 5 m and > 55 cm: 14.3
  Wood > 5 m and < 55 cm: 157.0
  Wood > 5 m and > 55 cm: 14.3

Mean Channel Width: 4.9 m
Mean Riparian Width: 20.5 m
  Mean Maximum Riparian Distance (either side): 11.1 m
  Mean Minimum Riparian Distance (either side): 4.5 m
  Maximum Riparian Width (Total): 12.8 m
  Minimum Riparian Width (Total): 3.0 m
Dell's Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 38.5%

Rosgen's Channel Type Frequency:
  - Channel Type A:
  - Channel Type B: 65.2%
  - Channel Type C: 34.8%
  - Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 75.0%

Average Channel Gradient: 6.3
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Dell's Branch

Number of Pieces per Kilometer

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>408.5</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>14.3</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>156.0</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>14.3</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>223.0</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Total LWD

Dell's Branch

LWD > 5 m > 55 cm

Number of Pieces vs Distance (m)
Dell's Branch
Substrate Composition

Pools

Frequency (%)
Cumulative Percent

Organic  Clay  Silt  Sand  Sm. Gravel  Lg. Gravel  Cobble  Boulder  Bedrock

Dominant
Subdominant

Riffles

Frequency (%)
Cumulative Percent

Organic  Clay  Silt  Sand  Sm. Gravel  Lg. Gravel  Cobble  Boulder  Bedrock

Dominant
Subdominant
Riparian Width
Stream: Dell's Branch
Number of Measurements: 3
Mean Width: 20.5m  Std Dev: 4.1
Max: 23.9m  Min: 16.0m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Dell's Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Dell's Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: East Fork Hopkins Branch
District: Mount Rogers National Recreation Area
Quadrangle: Whitetop Mtn.
Sample Date: 06/29/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 1.1 kilometers
  Percent of Total Area - Pools: 25.7%
  Number of Pools: 54
  Number of Pools per kilometer: 49.1
  Total Pool Area: 659.1 sq. meters ± 52.8
  Mean Pool Area: 12.2 sq. meters
  Correction Factor: 1.07
  Mean Maximum Depth: 27.1 cm
  Mean Average Depth: 17.8 cm
  Mean Average Residual Pool Depth: 16.2 cm
Percent of Total Area - Riffles: 74.3%
  Number of Riffles: 39
  Number of Riffles per kilometer: 35.5
  Total Riffle Area: 1904.5 sq. meters ± 704.5
  Mean Riffle Area: 48.8 sq. meters
  Correction Factor: 1.35
  Mean Maximum Depth: 17.5 cm
  Mean Average Depth: 9.1 cm
Number of Large Woody Debris Pieces per kilometer: 410.0
  Wood < 5 m and < 55 cm: 265.5
  Wood < 5 m and > 55 cm: 10.0
  Wood > 5 m and < 55 cm: 121.8
  Wood > 5 m and > 55 cm: 12.7
Mean Channel Width: 5.7 m
Mean Riparian Width: 15.3 m
  Mean Maximum Riparian Distance (either side): 7.8 m
  Mean Minimum Riparian Distance (either side): 1.8 m
  Maximum Riparian Width (Total): 24.9 m
  Minimum Riparian Width (Total): 9.2 m
East Fork Hopkins Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 57.6%

Rosgen's Channel Type Frequency:
  Channel Type A: 56.8%
  Channel Type B: 43.2%
  Channel Type C:
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 64.8%

Average Channel Gradient: 8.5
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
East Fork Hopkins Branch

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>410.0</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>12.7</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>121.8</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>10.0</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>265.8</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

East Fork Hopkins Branch

Number of Pieces

Distance (m)

Total LWD

LWD > 5 m > 55 cm
East Fork Hopkins Branch
Substrate Composition

Pools

Riffles

Cumulative Percent

Cumulative Percent

Frequency (%)

Frequency (%)

Dominant
Dominant
Subdominant
Subdominant

Organic  Clay  Silt  Sand  Sm. Gravel  Lg. Gravel  Cobble  Boulder  Bedrock
Organic  Clay  Silt  Sand  Sm. Gravel  Lg. Gravel  Cobble  Boulder  Bedrock
Riparian Width
Stream: East Fork Hopkins Branch
Number of Measurements: 4
Mean Width: 15.3m  Std Dev: 6.8
Max: 24.9m  Min: 9.2m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
East Fork Hopkins Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat
East Fork Hopkins Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Grassy Branch
District: Mount Rogers National Recreation Area
Quadrangle: Whitetop Mtn.
Sample Date: 07/06/98
Downstream Starting Point: Forest Service Boundary at Grassy Branch trail crossing
Total Distance Surveyed: 0.8 kilometers

Percent of Total Area - Pools: 21.1%
Number of Pools: 33
Number of Pools per kilometer: 41.3
Total Pool Area: 586.6 sq. meters ± 142.1
Mean Pool Area: 17.8 sq. meters
Correction Factor: 1.04
Mean Maximum Depth: 49.1 cm
Mean Average Depth: 34.4 cm
Mean Average Residual Pool Depth: 26.6 cm

Percent of Total Area - Riffles: 78.9%
Number of Riffles: 32
Number of Riffles per kilometer: 40
Total Riffle Area: 2188.5 sq. meters ± 149.6
Mean Riffle Area: 68.4 sq. meters
Correction Factor: 1.13
Mean Maximum Depth: 33.3 cm
Mean Average Depth: 16.8 cm

Number of Large Woody Debris Pieces per kilometer: 268.1
Wood < 5 m and < 55 cm: 186.3
Wood < 5 m and > 55 cm: 10.8
Wood > 5 m and < 55 cm: 42.1
Wood > 5 m and > 55 cm: 28.9

Mean Channel Width: 6.3 m
Mean Riparian Width: 15.0 m
Mean Maximum Riparian Distance (either side): 7.8 m
Mean Minimum Riparian Distance (either side): 0.9 m
Maximum Riparian Width (Total): 20.8 m
Minimum Riparian Width (Total): 6.8 m
Grassy Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 39.2%

Rosen's Channel Type Frequency:
- Channel Type A: 33.8%
- Channel Type B: 41.2%
- Channel Type C: 25.0%
- Channel Type D:

Percent Pools with > 35% Embeddedness: 42.4%

Average Channel Gradient: 27.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Distribution and Abundance of Large Woody Debris

Grassy Branch

Number of Pieces

Total LWD

LWD > 5 m > 55 cm

Distance (m)
Grassy Branch
Substrate Composition

**Pools**

- Frequency (%)
- Cumulative Percent
- Organic, Clay, Silt, Sand, Sm. Gravel, Lg. Gravel, Cobble, Boulder, Bedrock

**Riffles**

- Frequency (%)
- Cumulative Percent
- Organic, Clay, Silt, Sand, Sm. Gravel, Lg. Gravel, Cobble, Boulder, Bedrock
Riparian Width
Stream: Grassy Branch
Number of Measurements: 5
Mean Width: 15.0m  Std Dev: 5.9
Max: 20.8m  Min: 6.8m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Grassy Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Grassy Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Jerry's Creek
District: Mount Rogers National Recreation Area
Quadrangle: Whitetop Mtn.
Sample Date: 07/07/98
Downstream Starting Point: Forest Service Boundary

Total Distance Surveyed: 1.7 kilometers
  Percent of Total Area - Pools: 19.7%
  Number of Pools: 82
  Number of Pools per kilometer: 48.2
  Total Pool Area: 848.6 sq. meters ± 167.2
  Mean Pool Area: 10.3 sq. meters
  Correction Factor: 0.94
  Mean Maximum Depth: 39.1 cm
  Mean Average Depth: 26.4 cm
  Mean Average Residual Pool Depth: 19.1 cm

Percent of Total Area - Riffles: 80.3%
  Number of Riffles: 71
  Number of Riffles per kilometer: 41.8
  Total Riffle Area: 3457.1 sq. meters ± 754.2
  Mean Riffle Area: 48.7 sq. meters
  Correction Factor: 1.06
  Mean Maximum Depth: 23.5 cm
  Mean Average Depth: 11.6 cm

Number of Large Woody Debris Pieces per kilometer: 175.5
  Wood < 5 m and < 55 cm: 110.2
  Wood < 5 m and > 55 cm: 15.0
  Wood > 5 m and < 55 cm: 38.9
  Wood > 5 m and > 55 cm: 11.4

Mean Channel Width: 4.7 m
Mean Riparian Width: 15.6 m
  Mean Maximum Riparian Distance (either side): 8.6 m
  Mean Minimum Riparian Distance (either side): 2.3 m
  Maximum Riparian Width (Total): 25.0 m
  Minimum Riparian Width (Total): 11.9 m
Jerry's Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 38.1%

Rosgen's Channel Type Frequency:
- Channel Type A: 34.4%
- Channel Type B: 57.1%
- Channel Type C: 8.5%
- Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 22.0%

Average Channel Gradient: 6.4
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Jerry's Creek

Number of Pieces per Kilometer

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>175.5</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>11.4</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>38.9</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>15.0</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>110.2</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Number of Pieces

LWD > 5 m > 55 cm

Distance (m)

Total LWD

Jerry's Creek
Riparian Width
Stream: Jerry's Creek
Number of Measurements: 4
Mean Width: 15.5m  Std Dev: 6.4
Max: 25.0m  Min: 12.0m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Jerry's Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area
19.7%

Riffle Area
80.3%

30%
70%
Stream: Little Laurel Creek
District: Mount Rogers National Recreation Area
Quadrangle: Whitetop Mtn.
Sample Date: 06/19/98
Downstream Starting Point: Forest Service Boundary

Total Distance Surveyed: 5.5 kilometers

Percent of Total Area - Pools: 31.6%
Number of Pools: 194
Number of Pools per kilometer: 35.3
Total Pool Area: 5237.9 sq. meters ± 194.1
Mean Pool Area: 27.0 sq. meters
Correction Factor: 1.04
Mean Maximum Depth: 42.4 cm
Mean Average Depth: 26.5 cm
Mean Average Residual Pool Depth: 15.3 cm

Percent of Total Area - Riffles: 68.4%
Number of Riffles: 124
Number of Riffles per kilometer: 22.5
Total Riffle Area: 11314.1 sq. meters ± 823.0
Mean Riffle Area: 91.2 sq. meters
Correction Factor: 1.08
Mean Maximum Depth: 31.5 cm
Mean Average Depth: 17.6 cm

Number of Large Woody Debris Pieces per kilometer: 360.3
Wood < 5 m and < 55 cm: 262.5
Wood < 5 m and > 55 cm: 18.0
Wood > 5 m and < 55 cm: 71.3
Wood > 5 m and > 55 cm: 8.5

Mean Channel Width: 7.1 m
Mean Riparian Width: 24.3 m
Mean Maximum Riparian Distance (either side): 13.8 m
Mean Minimum Riparian Distance (either side): 3.4 m
Maximum Riparian Width (Total): 39.7 m
Minimum Riparian Width (Total): 16.1 m
Little Laurel Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 66.2%

Rosgen’s Channel Type Frequency:
  Channel Type A: 13.0%
  Channel Type B: 85.2%
  Channel Type C: 1.8%
  Channel Type D:

Percent Pools with > 35% Embeddedness: 43.3%

Average Channel Gradient: 7.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Little Laurel Creek

Large Woody Debris

- Total: 350.3
- > 5 m > 55 cm: 8.5
- > 5 m < 55 cm: 71.3
- < 5 m > 55 cm: 18.0
- < 5 m < 55 cm: 262.5

Number of Pieces per Kilometer
Distribution and Abundance of Large Woody Debris

Little Laurel Creek

Number of Pieces

Distance (m)

Total LWD

LWD > 5 m > 55 cm

0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500

70 60 50 40 30 20 10 0
Little Laurel Creek
Substrate Composition

**Pools**

- **Dominant**
- **Subdominant**
- **Cumulative Percent**

**Riffles**

- **Dominant**
- **Subdominant**
- **Cumulative Percent**
Riparian Width
Stream: Little Laurel Creek
Number of Measurements: 9
Mean Width: 24.4m  Std Dev: 8.6
Max: 39.7m  Min: 16.1m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Little Laurel Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

- Pool Area: 31.6%
- Riffle Area: 68.4%
Little Laurel Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Pennington Branch
District: Mount Rogers National Recreation Area
Quadrangle: Whitetop Mtn.
Sample Date: 07/14/98
Downstream Starting Point: Forest Service Boundary

Total Distance Surveyed: 1.6 kilometers

Percent of Total Area - Pools: 20.4%
Number of Pools: 64
Number of Pools per kilometer: 40.0
Total Pool Area: 818.9 sq. meters ± 207.0
Mean Pool Area: 12.8 sq. meters
Correction Factor: 1.05
Mean Maximum Depth: 41.3 cm
Mean Average Depth: 28.5 cm
Mean Average Residual Pool Depth: 20.9 cm
Percent of Total Area - Riffles: 79.6%
Number of Riffles: 56
Number of Riffles per kilometer: 35
Total Riffle Area: 3191.9 sq. meters ± 193.1
Mean Riffle Area: 57.0 sq. meters
Correction Factor: 1.01
Mean Maximum Depth: 27.2 cm
Mean Average Depth: 13.9 cm

Number of Large Woody Debris Pieces per kilometer: 188.3
Wood < 5 m and < 55 cm: 132.4
Wood < 5 m and > 55 cm: 8.2
Wood > 5 m and < 55 cm: 38.9
Wood > 5 m and > 55 cm: 8.8

Mean Channel Width: 4.8 m
Mean Riparian Width: 16.2 m
Mean Maximum Riparian Distance (either side): 8.1 m
Mean Minimum Riparian Distance (either side): 3.3 m
Maximum Riparian Width (Total): 20.3 m
Minimum Riparian Width (Total): 12.4 m
Pennington Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 18.7%

Rosgen's Channel Type Frequency:
  Channel Type A: 82.0%
  Channel Type B: 18.0%
  Channel Type C: 
  Channel Type D:

Percent Pools with $\geq$ 35% Embeddedness: 21.9%

Average Channel Gradient: 6.7
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Pennington Branch

![Bar chart showing the number of pieces per kilometer for different categories of large woody debris.]

- **Total**: 188.3
- **> 5 m > 55 cm**: 8.8
- **> 5 m < 55 cm**: 38.9
- **< 5 m > 55 cm**: 8.2
- **< 5 m < 55 cm**: 132.4

**Number of Pieces per Kilometer**
Distribution and Abundance of Large Woody Debris

Pennington Branch

Number of Pieces

Distance (m)

Total LWD

LWD > 5 m > 55 cm

30 25 20 15 10 5 0

0 200 400 600 800 1000 1200 1400 1600
Pennington Branch
Substrate Composition

Pools

Riffles

Cumulative Percent

Frequency (%)
Riparian Width
Stream: Pennington Branch
Number of Measurements: 3
Mean Width: 16.2m  Std Dev: 4.0
Max: 20.3m  Min: 12.4m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Pennington Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area
20.4%

Riffle Area
79.6%

30%

70%
Pennington Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)

A
B
C
Stream: Rowland Creek
District: Mount Rogers National Recreation Area
Quadrangle: Whitetop Mtn.
Sample Date: 07/07/98
Downstream Starting Point: Forest Service Boundary; Junction RT 668 & 643
Total Distance Surveyed: 4.1 kilometers

Percent of Total Area - Pools: 40.1%
Number of Pools: 278
Number of Pools per kilometer: 67.8
Total Pool Area: 3888.4 sq. meters ± 172.3
Mean Pool Area: 14.0 sq. meters
Correction Factor: 1.03
Mean Maximum Depth: 42.3 cm
Mean Average Depth: 28.9 cm
Mean Average Residual Pool Depth: 18.9 cm
Percent of Total Area - Riffles: 59.9%
Number of Riffles: 200
Number of Riffles per kilometer: 48.8
Total Riffle Area: 5802.4 sq. meters ± 2044.6
Mean Riffle Area: 29.0 sq. meters
Correction Factor: 0.94
Mean Maximum Depth: 23.1 cm
Mean Average Depth: 14.3 cm

Number of Large Woody Debris Pieces per kilometer: 348.6
Wood < 5 m and < 55 cm: 181.8
Wood < 5 m and > 55 cm: 28.3
Wood > 5 m and < 55 cm: 114.9
Wood > 5 m and > 55 cm: 23.6
Mean Channel Width: 5.7 m
Mean Riparian Width: 14.8 m
Mean Maximum Riparian Distance (either side): 7.9 m
Mean Minimum Riparian Distance (either side): 1.2 m
Maximum Riparian Width (Total): 24.6 m
Minimum Riparian Width (Total): 7.0 m
Rowland Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 11.7%

Rosgen's Channel Type Frequency:
  - Channel Type A: 31.7%
  - Channel Type B: 64.2%
  - Channel Type C: 4.1%
  - Channel Type D:

Percent Pools with > 35% Embeddedness: 85.3%

Average Channel Gradient: 9.1
Rowland Creek

Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Rowland Creek

Large Woody Debris

<table>
<thead>
<tr>
<th>Size Category</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>348.6</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>23.6</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>114.9</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>28.3</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>181.2</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Number of Pieces

Total LWD

LWD > 5 m > 55 cm

Distance (m)

Rowland Creek
Rowland Creek
Substrate Composition

Pools

Riffles
Riparian Width
Stream: Rowland Creek
Number of Measurements: 13
Mean Width: 14.9m  Std Dev: 5.6
Max: 24.6m  Min: 7.0m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Rowland Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat
Rowland Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Whitetop Creek
District: Mount Rogers National Recreation Area
Quadrangle: Park/Whitetop Mtn.
Sample Date: 07/08/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 1.4 kilometers
   Percent of Total Area - Pools: 15.5%
   Number of Pools: 55
   Number of Pools per kilometer: 39.3
   Total Pool Area: 707.3 sq. meters ± 60.2
   Mean Pool Area: 12.9 sq. meters
   Correction Factor: 1.02
   Mean Maximum Depth: 47.8 cm
   Mean Average Depth: 36.2 cm
   Mean Average Residual Pool Depth: 28.5 cm
   Percent of Total Area - Riffles: 84.5%
   Number of Riffles: 51
   Number of Riffles per kilometer: 36.4
   Total Riffle Area: 3886.2 sq. meters ± 1273.1
   Mean Riffle Area: 75.8 sq. meters
   Correction Factor: 1.21
   Mean Maximum Depth: 30.9 cm
   Mean Average Depth: 16.2 cm
Number of Large Woody Debris Pieces per kilometer: 184.9
   Wood < 5 m and < 55 cm: 113.4
   Wood < 5 m and > 55 cm: 13.3
   Wood > 5 m and < 55 cm: 44.9
   Wood > 5 m and > 55 cm: 13.3
Mean Channel Width: 5.0 m
Mean Riparian Width: 17.5 m
   Mean Maximum Riparian Distance (either side): 9.3 m
   Mean Minimum Riparian Distance (either side): 3.2 m
   Maximum Riparian Width (Total): 22.9 m
   Minimum Riparian Width (Total): 11.5 m
Whitetop Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 17.0%

Rosgen's Channel Type Frequency:
  Channel Type A: 72.2%
  Channel Type B: 25.0%
  Channel Type C: 2.8%
  Channel Type D:

Percent Pools with $\geq$ 35% Embeddedness: 36.4%

Average Channel Gradient: 25.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Whitetop Creek

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>184.9</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>13.3</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>44.9</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>13.3</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>113.4</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Number of Pieces

Distance (m)

Total LWD

Whitetop Creek

LWD > 5 m > 55 cm
Riparian Width
Stream: Whitetop Creek
Number of Measurements: 3
Mean Width: 17.6m  Std Dev: 5.7
Max: 22.9m       Min: 11.5m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Whitetop Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat
Whitetop Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Dickey's Creek
District: Mount Rogers National Recreation Area
Quadrangle: Atkins/Troutdale
Sample Date: 07/09/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 3.4 kilometers

Percent of Total Area - Pools: 54.5%
Number of Pools: 161
Number of Pools per kilometer: 47.4
Total Pool Area: 6173.9 sq. meters ± 561.3
Mean Pool Area: 38.3 sq. meters
Correction Factor: 1.09
Mean Maximum Depth: 36.7 cm
Mean Average Depth: 23.6 cm
Mean Average Residual Pool Depth: 17.8 cm

Percent of Total Area - Riffles: 45.5%
Number of Riffles: 78
Number of Riffles per kilometer: 22.9
Total Riffle Area: 5164.4 sq. meters ± 733.8
Mean Riffle Area: 66.2 sq. meters
Correction Factor: 1.04
Mean Maximum Depth: 19.6 cm
Mean Average Depth: 9.9 cm

Number of Large Woody Debris Pieces per kilometer: 69.5

Wood < 5 m and < 55 cm: 42.6
Wood < 5 m and > 55 cm: 0.9
Wood > 5 m and < 55 cm: 21.9
Wood > 5 m and > 55 cm: 4.1

Mean Channel Width: 7.4 m
Mean Riparian Width: 47.6 m

Mean Maximum Riparian Distance (either side): 34.2 m
Mean Minimum Riparian Distance (either side): 6.0 m
Maximum Riparian Width (Total): 55.7 m
Minimum Riparian Width (Total): 34.8 m
Dickey's Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 28.8%

Rosgen's Channel Type Frequency:
  Channel Type A: 5.2%
  Channel Type B: 67.6%
  Channel Type C: 27.2%
  Channel Type D:

Percent Pools with > 35% Embeddedness: 20.5%

Average Channel Gradient: 4.0
Dickey's Creek

Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Distribution and Abundance of Large Woody Debris

Number of Pieces

Distance (m)

Total LWD

Dickey's Creek

LWD > 5 m > 55 cm
Riparian Width
Stream: Dickey’s Creek
Number of Measurements: 4
Mean Width: 47.5m  Std Dev: 9.1
Max: 55.7m  Min: 34.8m

Dickey's Creek

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Dickey's Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

Pool Area 54.5%

Riffle Area 45.5%

30%

70%
Dickey's Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Houndshell Branch
District: Mount Rogers National Recreation Area
Quadrangle: Atkins/Troutdale/Middle Fox Cr.
Sample Date: 07/15/98
Downstream Starting Point: Confluence with Cressy Creek
Total Distance Surveyed: 2.3 kilometers
Percent of Total Area - Pools: 33.2%
Number of Pools: 144
Number of Pools per kilometer: 62.6
Total Pool Area: 1175.2 sq. meters ± 79.1
Mean Pool Area: 8.2 sq. meters
Correction Factor: 1.04
Mean Maximum Depth: 34.4 cm
Mean Average Depth: 24.9 cm
Mean Average Residual Pool Depth: 18.3 cm
Percent of Total Area - Riffles: 66.8%
Number of Riffles: 122
Number of Riffles per kilometer: 53.0
Total Riffle Area: 3389.7 sq. meters ± 248.3
Mean Riffle Area: 27.8 sq. meters
Correction Factor: 1.08
Mean Maximum Depth: 20.3 cm
Mean Average Depth: 11.8 cm
Number of Large Woody Debris Pieces per kilometer: 433.6
Wood < 5 m and < 55 cm: 259.8
Wood < 5 m and > 55 cm: 8.1
Wood > 5 m and < 55 cm: 153.3
Wood > 5 m and > 55 cm: 12.4
Mean Channel Width: 5.3 m
Mean Riparian Width: 14.9 m
Mean Maximum Riparian Distance (either side): 7.9 m
Mean Minimum Riparian Distance (either side): 1.7 m
Maximum Riparian Width (Total): 23.5 m
Minimum Riparian Width (Total): 9.4 m
Houndshell Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 24.3%

Rogen's Channel Type Frequency:
    - Channel Type A: 47.3%
    - Channel Type B: 45.8%
    - Channel Type C: 6.9%
    - Channel Type D:

Percent Pools with $\geq$ 35% Embeddedness: 84.7%

Average Channel Gradient: 9.4
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Houndshell Branch

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>433.5</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>12.3</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>153.3</td>
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<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>8.1</td>
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<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>259.6</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Houndshell Branch

Number of Pieces

Distance (m)

LWD > 5 m > 55 cm

Total LWD
Riparian Width
Stream: Houndshell Branch
Number of Measurements: 8
Mean Width: 14.9m  Std Dev: 5.6
Max: 23.5m       Min: 9.4m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Houndshell Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Houndshell Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)

0 500 1000 1500 2000 2500
Stream: Little Wilson Creek
District: Mount Rogers National Recreation Area
Quadrangle: Troutdale
Sample Date: 07/14/98
Downstream Starting Point: Confluence with Big Wilson Creek
Total Distance Surveyed: 2.5 kilometers

Percent of Total Area - Pools: 40.3%
Number of Pools: 117
Number of Pools per kilometer: 46.8
Total Pool Area: 2465.9 sq. meters + 224.1
Mean Pool Area: 21.1 sq. meters
Correction Factor: 1.11
Mean Maximum Depth: 49.5 cm
Mean Average Depth: 33.8 cm
Mean Average Residual Pool Depth: 25.5 cm

Percent of Total Area - Riffles: 59.7%
Number of Riffles: 84
Number of Riffles per kilometer: 33.6
Total Riffle Area: 3649.3 sq. meters + 490.1
Mean Riffle Area: 43.4 sq. meters
Correction Factor: 0.95
Mean Maximum Depth: 28.9 cm
Mean Average Depth: 12.8 cm

Number of Large Woody Debris Pieces per kilometer: 77.1
Wood < 5 m and < 55 cm: 56.3
Wood < 5 m and > 55 cm: 9.0
Wood > 5 m and < 55 cm: 5.7
Wood > 5 m and > 55 cm: 6.1

Mean Channel Width: 7.0 m
Mean Riparian Width: 19.2 m
Mean Maximum Riparian Distance (either side): 10.9 m
Mean Minimum Riparian Distance (either side): 1.3 m
Maximum Riparian Width (Total): 42.1 m
Minimum Riparian Width (Total): 9.0 m
Little Wilson Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 3.2%

Rosgen's Channel Type Frequency:
   Channel Type A: 65.0%
   Channel Type B: 34.0%
   Channel Type C: 1.0%
   Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 41.0%

Average Channel Gradient: 13.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Little Wilson Creek

Number of Pieces per Kilometer

- Total: 77.3
- > 5 m > 55 cm: 6.1
- > 5 m < 55 cm: 5.7
- < 5 m > 55 cm: 9.0
- < 5 m < 55 cm: 56.3

Large Woody Debris
Little Wilson Creek Substrate Composition

**Pools**

- Frequency (%)
- Cumulative Percent
- Organic
- Clay
- Silt
- Sand
- Sm. Gravel
- Lg. Gravel
- Cobble
- Boulder
- Bedrock

**Riffles**

- Frequency (%)
- Cumulative Percent
- Organic
- Clay
- Silt
- Sand
- Sm. Gravel
- Lg. Gravel
- Cobble
- Boulder
- Bedrock
Riparian Width
Stream: Little Wilson Creek
Number of Measurements: 4
Mean Width: 19.1m  Std Dev: 15.7
Max: 42.1m  Min: 9.0m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Little Wilson Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Little Wilson Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Raccoon Branch
District: Mount Rogers National Recreation Area
Quadrangle: Trudtle
Sample Date: 07/13/98
Downstream Starting Point: Confluence with Dickey's Creek
Total Distance Surveyed: 0.9 kilometers
  Percent of Total Area - Pools: 55.4%
  Number of Pools: 48
  Number of Pools per kilometer: 51.1
  Total Pool Area: 1185.4 sq. meters ± 292.3
  Mean Pool Area: 25.8 sq. meters
  Correction Factor: 1.31
  Mean Maximum Depth: 29.0 cm
  Mean Average Depth: 17.8 cm
  Mean Average Residual Pool Depth: 11.4 cm
Percent of Total Area - Riffles: 44.6%
  Number of Riffles: 28
  Number of Riffles per kilometer: 31.1
  Total Riffle Area: 955.2 sq. meters ± 49.2
  Mean Riffle Area: 34.1 sq. meters
  Correction Factor: 1.16
  Mean Maximum Depth: 20.4 cm
  Mean Average Depth: 10.6 cm
Number of Large Woody Debris Pieces per kilometer: 158.6
  Wood < 5 m and < 55 cm: 93.7
  Wood < 5 m and > 55 cm: 1.2
  Wood > 5 m and < 55 cm: 62.5
  Wood > 5 m and > 55 cm: 1.2
Mean Channel Width: 6.5 m
Mean Riparian Width: 20.8 m
  Mean Maximum Riparian Distance (either side): 11.7 m
  Mean Minimum Riparian Distance (either side): 2.6 m
  Maximum Riparian Width (Total): 34.9 m
  Minimum Riparian Width (Total): 14.7 m
Raccoon Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 42.3%

Rosgen's Channel Type Frequency:
  - Channel Type A: 5.0%
  - Channel Type B: 95.0%
  - Channel Type C:
  - Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 69.6%

Average Channel Gradient: 4.0
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Raccoon Branch

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>158.6</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>1.2</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>62.4</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>1.2</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>93.7</td>
</tr>
</tbody>
</table>
Riparian Width
Stream: Raccoon Branch
Number of Measurements: 4
Mean Width: 20.7m  Std Dev: 9.6
Max: 34.9m  Min: 14.7m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Raccoon Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat
Raccoon Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Solomon Branch
District: Mount Rogers National Recreation Area
Quadrangle: Troudale
Sample Date: 06/22/98
Downstream Starting Point: Forest Service Boundary @ State Rt. 739
Total Distance Surveyed: 0.8 kilometers
  Percent of Total Area - Pools: 7.8%
  Number of Pools: 16
  Number of Pools per kilometer: 20
  Total Pool Area: 179.7 sq. meters
  Mean Pool Area: 11.2 sq. meters
  Correction Factor: 0.98
  Mean Maximum Depth: 36.9 cm
  Mean Average Depth: 22.5 cm
  Mean Average Residual Pool Depth: 10.7 cm
Percent of Total Area - Riffles: 92.2%
  Number of Riffles: 16
  Number of Riffles per kilometer: 20
  Total Riffle Area: 2112.4 sq. meters + 584.0
  Mean Riffle Area: 132.0 sq. meters
  Correction Factor: 0.94
  Mean Maximum Depth: 31.9 cm
  Mean Average Depth: 16.3 cm
Number of Large Woody Debris Pieces per kilometer: 197.5
  Wood < 5 m and < 55 cm: 135.5
  Wood < 5 m and > 55 cm: 3.3
  Wood > 5 m and < 55 cm: 57.1
  Wood > 5 m and > 55 cm: 1.6
Mean Channel Width: 4.7 m
Mean Riparian Width: 22.5 m
  Mean Maximum Riparian Distance (either side): 13.9 m
  Mean Minimum Riparian Distance (either side): 3.9 m
  Maximum Riparian Width (Total): 24.0 m
  Minimum Riparian Width (Total): 20.8 m
Solomon Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 23.3%

Rosgen's Channel Type Frequency:

Channel Type A: 14.3%
Channel Type B: 57.1%
Channel Type C: 28.6%
Channel Type D:

Percent Pools with $\geq 35\%$ Embeddedness: 68.8%

Average Channel Gradient: 10.0
Solomon Branch

Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Solomon Branch

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>1.6</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>57.1</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>3.3</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>135.5</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Total LWD

Solomon Branch

LWD > 5 m > 55 cm

Number of Pieces

Distance (m)
Solomon Branch
Substrate Composition

**Pools**
- Frequency (%)
- Cumulative Percent
- Organic, Clay, Silt, Sand, Sm. Gravel, Lg. Gravel, Cobble, Boulder, Bedrock
- Dominant (solid black), Subdominant (dashed black)

**Riffles**
- Frequency (%)
- Cumulative Percent
- Organic, Clay, Silt, Sand, Sm. Gravel, Lg. Gravel, Cobble, Boulder, Bedrock
- Dominant (solid black), Subdominant (dashed black)
Riparian Width
Stream: Solomon Branch
Number of Measurements: 2
Mean Width: 22.4m  Std Dev: 2.3
Max: 24.0m  Min: 20.8m

Solomon Branch

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Solomon Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Solomon Branch
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Atkins Quadrangle
Stream: Cressy Creek
District: Mount Rogers National Recreation Area
Quadrangle: Atkins/Cedar Springs
Sample Date: 07/16/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 3.4 kilometers
  Percent of Total Area - Pools: 40.0%
  Number of Pools: 156
  Number of Pools per kilometer: 45.9
  Total Pool Area: 6173.9 sq. meters + 561.3
  Mean Pool Area: 39.6 sq. meters
  Correction Factor: 1.07
  Mean Maximum Depth: 39.1 cm
  Mean Average Depth: 24.4 cm
  Mean Average Residual Pool Depth: 16.0 cm
Percent of Total Area - Riffles: 60.0%
  Number of Riffles: 99
  Number of Riffles per kilometer: 29.1
  Total Riffle Area: 6736.7 sq. meters + 435.9
  Mean Riffle Area: 68.0 sq. meters
  Correction Factor: 1.01
  Mean Maximum Depth: 24.0 cm
  Mean Average Depth: 14.5 cm
Number of Large Woody Debris Pieces per kilometer: 63.6
  Wood < 5 m and < 55 cm: 38.8
  Wood < 5 m and > 55 cm: 0.6
  Wood > 5 m and < 55 cm: 19.8
  Wood > 5 m and > 55 cm: 4.4
Mean Channel Width: 7.8 m
Mean Riparian Width: 23.5 m
  Mean Maximum Riparian Distance (either side): 14.0 m
  Mean Minimum Riparian Distance (either side): 1.7 m
  Maximum Riparian Width (Total): 51.1 m
  Minimum Riparian Width (Total): 9.9 m
Cressy Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 29.9%

Rosgen's Channel Type Frequency:
   Channel Type A: 36.2%
   Channel Type B: 38.6%
   Channel Type C: 25.2%
   Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 46.8%

Average Channel Gradient: 5.3
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Cressy Creek

Large Woody Debris

- Total: 63.6
- > 5 m > 55 cm: 4.4
- > 5 m < 55 cm: 19.8
- < 5 m > 55 cm: 0.6
- < 5 m < 55 cm: 38.8

Number of Pieces per Kilometer

DFC
Distribution and Abundance of Large Woody Debris

Cressy Creek

Number of Pieces

Distance (m)

LWD > 5 m > 55 cm

Total LWD
Cressy Creek
Substrate Composition

Pools

Riffles

Cumulative Percent

Frequency (%)

Dominant
Subdominant
Dominant
Subdominant

Frequency (%)

Cumulative Percent

Organic Clay Silt Sand Sm. Gravel Lg. Gravel Cobble Boulder Bedrock

Organic Clay Silt Sand Sm. Gravel Lg. Gravel Cobble Boulder Bedrock
Riparian Width
Stream: Cressy Creek
Number of Measurements: 9
Mean Width: 23.5m  Std Dev: 13.5
Max: 51.1m  Min: 9.9m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Cressy Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Cressy Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)

0 250 500 750 1000 1250 1500 1750 2000 2250 2500 2750 3000 3250 3500
Stream: East Fork Nicks Creek
District: Mount Rogers National Recreation Area/Old Wythe Ranger District
Quadrangle: Atkins
Sample Date: 07/21/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 1.4 kilometers
  Percent of Total Area - Pools: 17.9%
  Number of Pools: 67
  Number of Pools per kilometer: 47.9
  Total Pool Area: 528.8 sq. meters ± 15.5
  Mean Pool Area: 7.9 sq. meters
  Correction Factor: 1.05
  Mean Maximum Depth: 31.2 cm
  Mean Average Depth: 23.1 cm
  Mean Average Residual Pool Depth: 17.2 cm
Percent of Total Area - Riffles: 82.1%
  Number of Riffles: 59
  Number of Riffles per kilometer: 42.1
  Total Riffle Area: 2424.1 sq. meters ± 57.8
  Mean Riffle Area: 41.1 sq. meters
  Correction Factor: 1.09
  Mean Maximum Depth: 18.9 cm
  Mean Average Depth: 11.3 cm
Number of Large Woody Debris Pieces per kilometer: 88.4
  Wood < 5 m and < 55 cm: 66.3
  Wood < 5 m and > 55 cm: 3.0
  Wood > 5 m and < 55 cm: 18.4
  Wood > 5 m and > 55 cm: 0.7
Mean Channel Width: 4.6 m
Mean Riparian Width: 15.8 m
  Mean Maximum Riparian Distance (either side): 9.4 m
  Mean Minimum Riparian Distance (either side): 1.8 m
  Maximum Riparian Width (Total): 27.3 m
  Minimum Riparian Width (Total): 9.7 m
East Fork Nicks Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 35.0%

Rosgen's Channel Type Frequency:
  Channel Type A:
  Channel Type B: 100%
  Channel Type C:
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 52.2%

Average Channel Gradient: 8.0
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
East Fork Nicks Creek

Number of Pieces per Kilometer

- Total: 88.4
- > 5 m > 55 cm: 0.7
- > 5 m < 55 cm: 18.4
- < 5 m > 55 cm: 2.9
- < 5 m < 55 cm: 33.6

Large Woody Debris
Distribution and Abundance of Large Woody Debris

Number of Pieces

Distance (m)

Total LWD

East Fork Nicks Creek

LWD > 5 m > 55 cm
Riparian Width
Stream: East Fork Nicks Creek
Number of Measurements: 6
Mean Width: 15.7m  Std Dev: 6.4
Max: 27.3m   Min: 9.7m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
East Fork Nicks Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area
17.9%

Riffle Area
82.1%

30%

70%
East Fork Nicks Creek
Rosgen's Channel Type Distribution

Diagram showing channel type distribution along a distance of 0 to 1400 meters, with labeled sections A, B, and C.
Stream: Nicks Creek
District: Mount Rogers National Recreation Area/Old Wythe Ranger District
Quadrangle: Atkins
Sample Date: 09/09/98
Downstream Starting Point: Confluence of East Fork Nicks Creek
Total Distance Surveyed: 2.7 kilometers

Percent of Total Area - Pools: 28.0%
Number of Pools: 157
Number of Pools per kilometer: 58.1
Total Pool Area: 2419.7 sq. meters ± 95.2
Mean Pool Area: 15.4 sq. meters
Correction Factor: 1.04
Mean Maximum Depth: 32.6 cm
Mean Average Depth: 22.4 cm
Mean Average Residual Pool Depth: 15.7 cm

Percent of Total Area - Riffles: 72.0%
Number of Riffles: 134
Number of Riffles per kilometer: 49.6
Total Riffle Area: 6207.5 sq. meters ± 191.8
Mean Riffle Area: 46.3 sq. meters
Correction Factor: 1.04
Mean Maximum Depth: 14.8 cm
Mean Average Depth: 9.4 cm

Number of Large Woody Debris Pieces per kilometer: 45.8
Wood < 5 m and < 55 cm: 33.6
Wood < 5 m and > 55 cm: 0.4
Wood > 5 m and < 55 cm: 11.8
Wood > 5 m and > 55 cm: 0.0

Mean Channel Width: 5.1 m
Mean Riparian Width: 21.3 m
Mean Maximum Riparian Distance (either side): 12.2 m
Mean Minimum Riparian Distance (either side): 4.0 m
Maximum Riparian Width (Total): 38.9 m
Minimum Riparian Width (Total): 11.4 m
Nicks Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 0.0%

Rosgen's Channel Type Frequency:
  Channel Type A: 55.7%
  Channel Type B: 38.3%
  Channel Type C: 6.0%
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: N/A

Average Channel Gradient: N/A
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Nicks Creek

Large Woody Debris

- Total: 45.6
- > 5 m > 55 cm: 0.0
- > 5 m < 55 cm: 11.8
- < 5 m > 55 cm: 0.4
- < 5 m < 55 cm: 23.6

Number of Pieces per Kilometer
Distribution and Abundance of Large Woody Debris

Nicks Creek

Number of Pieces

Distance (m)

Total LWD

LWD > 5 m > 55 cm
Nicks Creek
Substrate Composition

Pools

Riffles
Riparian Width
Stream: Nicks Creek
Number of Measurements: 5
Mean Width: 21.3m  Std Dev: 10.5
Max: 39.0m       Min: 11.4m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Nicks Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Nicks Creek
Rosgen's Channel Type Distribution
Stream: South Fork Holston River (Upper)
District: Mount Rogers National Recreation Area
Quadrangle: Atkins
Sample Date: 07/22/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 1.6 kilometers
  Percent of Total Area - Pools: 73.9%
  Number of Pools: 25
  Number of Pools per kilometer: 15.6
  Total Pool Area: 14159.6 sq. meters ± 10276.3
  Mean Pool Area: 566.4 sq. meters
  Correction Factor: 1.20
  Mean Maximum Depth: 69.8 cm
  Mean Average Depth: 47.6 cm
  Mean Average Residual Pool Depth: 29.5 cm
Percent of Total Area - Riffles: 26.1%
  Number of Riffles: 16
  Number of Riffles per kilometer: 10
  Total Riffle Area: 5004.7 sq. meters ± 883.0
  Mean Riffle Area: 312.8 sq. meters
  Correction Factor: 1.00
  Mean Maximum Depth: 41.3 cm
  Mean Average Depth: 28.4 cm
Number of Large Woody Debris Pieces per kilometer: 84.0
  Wood < 5 m and < 55 cm: 37.0
  Wood < 5 m and > 55 cm: 0.0
  Wood > 5 m and < 55 cm: 40.8
  Wood > 5 m and > 55 cm: 6.2
Mean Channel Width: 11.4 m
Mean Riparian Width: 43.4 m
  Mean Maximum Riparian Distance (either side): 26.6 m
  Mean Minimum Riparian Distance (either side): 5.4 m
  Maximum Riparian Width (Total): 51.8 m
  Minimum Riparian Width (Total): 34.8 m
South Fork Holston River (Upper) Continued.

Percent of Pool Habitat Surveyed as Glides: 33.4%

Rosgen’s Channel Type Frequency:
  - Channel Type A:
  - Channel Type B: 36.4%
  - Channel Type C: 63.6%
  - Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 16.0%

Average Channel Gradient: 2.0
South Fork Holston River (Upper)

Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
South Fork Holston River (Upper)

Number of Pieces per Kilometer

Large Woody Debris

Total 34.0
> 5 m > 55 cm 6.2
> 5 m < 55 cm 40.7
< 5 m > 55 cm 0.0
< 5 m < 55 cm 37.1
Distribution and Abundance of Large Woody Debris

Total LWD

South Fork Holston River (Upper)

Number of Pieces

LWD > 5 m > 55 cm

Distance (m)
South Fork Holston River (Upper)
Substrate Composition

**Pools**

- **Frequency (%)**
- **Cumulative Percent**
- **Organic**
- **Clay**
- **Silt**
- **Sand**
- **Sm. Gravel**
- **Lg. Gravel**
- **Cobble**
- **Boulder**
- **Bedrock**

**Riffles**

- **Frequency (%)**
- **Cumulative Percent**
- **Organic**
- **Clay**
- **Silt**
- **Sand**
- **Sm. Gravel**
- **Lg. Gravel**
- **Cobble**
- **Boulder**
- **Bedrock**

Legend:
- **Dominant**
- **Subdominant**
- **Dominant**
- **Subdominant**
Riparian Width
Stream: South Fork Holston River (Upper)
Number of Measurements: 2
Mean Width: 43.3m  Std Dev: 12.0
Max: 51.8m      Min: 34.8m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
South Fork Holston River (Upper)
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area
73.9%

Riffle Area
26.1%

30%
70%
South Fork Holston River (Upper)
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Marion Quadrangle
Stream: South Fork Holston River (Lower)
District: Mount Rogers National Recreation Area
Quadrangle: Marion
Sample Date: 07/22/98
Downstream Starting Point: Forest Service Boundary (Buller Bass Hatchery)
Total Distance Surveyed: 3.3 kilometers
  Percent of Total Area - Pools: 49.0%
  Number of Pools: 44
  Number of Pools per kilometer: 13.3
  Total Pool Area: 22823.2 sq. meters ± 5000.7
  Mean Pool Area: 518.7 sq. meters
  Correction Factor: 1.02
  Mean Maximum Depth: 85.2 cm
  Mean Average Depth: 50.1 cm
  Mean Average Residual Pool Depth: 26.3 cm
Percent of Total Area - Riffles: 51.0%
  Number of Riffles: 33
  Number of Riffles per kilometer: 10.0
  Total Riffle Area: 23744.9 sq. meters ± 17947.4
  Mean Riffle Area: 719.5 sq. meters
  Correction Factor: 1.09
  Mean Maximum Depth: 54.2 cm
  Mean Average Depth: 28.2 cm
Number of Large Woody Debris Pieces per kilometer: 83.0
  Wood < 5 m and < 55 cm: 48.7
  Wood < 5 m and > 55 cm: 0.3
  Wood > 5 m and < 55 cm: 27.9
  Wood > 5 m and > 55 cm: 6.1
Mean Channel Width: 18.0 m
Mean Riparian Width: 71.8 m
  Mean Maximum Riparian Distance (either side): 47.9 m
  Mean Minimum Riparian Distance (either side): 5.9 m
  Maximum Riparian Width (Total): 139.2 m
  Minimum Riparian Width (Total): 36.3 m
South Fork Holston River (Lower) Continued.

Percent of Pool Habitat Surveyed as Glides: 30.9%

Rosgen's Channel Type Frequency:
  Channel Type A:
  Channel Type B: 15.1%
  Channel Type C: 84.9%
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 25.0%

Average Channel Gradient: 3.3
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
South Fork Holston River (Lower)

Number of Pieces per Kilometer

Large Woody Debris

- Total: 83.0
- > 5 m > 55 cm: 6.1
- > 5 m < 55 cm: 27.3
- < 5 m > 55 cm: 0.3
- < 5 m < 55 cm: 46.7

DFC
Riparian Width
Stream: South Fork Holston River (Lower)
Number of Measurements: 3
Mean Width: 71.8m  Std Dev: 58.4
Max: 139.2m    Min: 36.3m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
South Fork Holston River (Lower)
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat
South Fork Holston River (Lower)
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: Staley Creek
District: Mount Rogers National Recreation Area
Quadrangle: Atkins/Marion
Sample Date: 07/22/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 0.8 kilometers
  Percent of Total Area - Pools: 58.3%
  Number of Pools: 41
  Number of Pools per kilometer: 51.3
  Total Pool Area: 959.5 sq. meters ± 8.1
  Mean Pool Area: 23.4 sq. meters
  Correction Factor: 0.96
  Mean Maximum Depth: 30.1 cm
  Mean Average Depth: 18.4 cm
  Mean Average Residual Pool Depth: 14.0 cm
Percent of Total Area - Riffles: 41.7%
  Number of Riffles: 20
  Number of Riffles per kilometer: 34.1
  Total Riffle Area: 686.0 sq. meters ± 150.1
  Mean Riffle Area: 34.3 sq. meters
  Correction Factor: 0.95
  Mean Maximum Depth: 17.5 cm
  Mean Average Depth: 10.2 cm

Number of Large Woody Debris Pieces per kilometer: 619.3
  Wood < 5 m and < 55 cm: 455.0
  Wood < 5 m and > 55 cm: 10.1
  Wood > 5 m and < 55 cm: 142.8
  Wood > 5 m and > 55 cm: 11.4

Mean Channel Width: 3.4 m
Mean Riparian Width: 74.8 m
  Mean Maximum Riparian Distance (either side): 45.1 m
  Mean Minimum Riparian Distance (either side): 26.3 m
  Maximum Riparian Width (Total): 79.4 m
  Minimum Riparian Width (Total): 70.0 m
Staley Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 52.1%

Rosgen's Channel Type Frequency:

Channel Type A:
Channel Type B: 46.0%
Channel Type C: 54.0%

Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 26.8%

Average Channel Gradient: 4.5
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Staley Creek

Number of Pieces per Kilometer

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>519.3</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>11.4</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>142.3</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>10.1</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>465.0</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Total LWD

Staley Creek

Number of Pieces

LWD > 5 m > 55 cm

Distance (m)
Riparian Width
Stream: Staley Creek
Number of Measurements: 2
Mean Width: 74.7m  Std Dev: 6.6
Max: 79.4m  Min: 70.0m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Staley Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area
58.3%

Riffle Area
41.7%

30%
70%
Staley Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Cedar Springs Quadrangle
Stream: Dry Creek
District: Mount Rogers National Recreation Area
Quadrangle: Cedar Springs
Sample Date: 07/22/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 1.8 kilometers
  Percent of Total Area - Pools: 41.8%
  Number of Pools: 100
  Number of Pools per kilometer: 55.6
  Total Pool Area: 1889.6 sq. meters ± 186.6
  Mean Pool Area: 18.9 sq. meters
Correction Factor: 1.01
  Mean Maximum Depth: 35.1 cm
  Mean Average Depth: 22.3 cm
  Mean Average Residual Pool Depth: 17.4 cm
Percent of Total Area - Riffles: 58.2%
  Number of Riffles: 75
  Number of Riffles per kilometer: 41.7
  Total Riffle Area: 2631.2 sq. meters ± 149.5
  Mean Riffle Area: 35.1 sq. meters
Correction Factor: 1.08
  Mean Maximum Depth: 17.6 cm
  Mean Average Depth: 8.7 cm
Number of Large Woody Debris Pieces per kilometer: 245.6
  Wood < 5 m and < 55 cm: 98.8
  Wood < 5 m and > 55 cm: 9.3
  Wood > 5 m and < 55 cm: 126.6
  Wood > 5 m and > 55 cm: 10.9
Mean Channel Width: 5.9 m
Mean Riparian Width: 11.5 m
  Mean Maximum Riparian Distance (either side): 4.7 m
  Mean Minimum Riparian Distance (either side): 0.9 m
  Maximum Riparian Width (Total): 19.1 m
  Minimum Riparian Width (Total): 7.0 m
Dry Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 18.6%

Rosgen's Channel Type Frequency:
  - Channel Type A: 33.5%
  - Channel Type B: 52.5%
  - Channel Type C: 14.0%
  - Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 37.0%

Average Channel Gradient: 9.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Dry Creek

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>245.6</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>10.9</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>126.6</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>9.2</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>98.8</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Dry Creek

Number of Pieces

Distance (m)

Total LWD

LWD > 5 m > 55 cm

0 200 400 600 800 1000 1200 1400 1600 1800 2000
Dry Creek
Substrate Composition

**Pools**
- Dominant
- Subdominant

**Riffles**
- Dominant
- Subdominant

Graphs showing the frequency (%) and cumulative percent for different substrate types in pools and riffles.
Riparian Width
Stream: Dry Creek
Number of Measurements: 6
Mean Width: 11.5m  Std Dev: 4.6
Max: 19.1m  Min: 7.0m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Dry Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

Pool Area 41.8%
Riffle Area 58.2%
Dry Creek
Rosgen's Channel Type Distribution
Stream: Killenger Creek
District: Mount Rogers National Recreation Area/Old Wythe Ranger District
Quadrangle: Cedar Springs
Sample Date: 07/20/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 2.2 kilometers

Percent of Total Area - Pools: 24.7%
Number of Pools: 86
Number of Pools per kilometer: 39.1
Total Pool Area: 1248.2 sq. meters + 108.2
Mean Pool Area: 14.5 sq. meters
Correction Factor: 1.08
Mean Maximum Depth: 38.0 cm
Mean Average Depth: 26.6 cm
Mean Average Residual Pool Depth: 20.9 cm

Percent of Total Area - Riffles: 75.3%
Number of Riffles: 75
Number of Riffles per kilometer: 34.1
Total Riffle Area: 3806.7 sq. meters + 309.0
Mean Riffle Area: 50.8 sq. meters
Correction Factor: 1.03
Mean Maximum Depth: 21.1 cm
Mean Average Depth: 11.7 cm

Number of Large Woody Debris Pieces per kilometer: 557.1
Wood < 5 m and < 55 cm: 6.8
Wood < 5 m and > 55 cm: 9.9
Wood > 5 m and < 55 cm: 344.3
Wood > 5 m and > 55 cm: 196.1

Mean Channel Width: 5.3 m
Mean Riparian Width: 17.1 m
Mean Maximum Riparian Distance (either side): 9.9 m
Mean Minimum Riparian Distance (either side): 1.9 m
Maximum Riparian Width (Total): 29.3 m
Minimum Riparian Width (Total): 10.8 m
Killenger Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 32.4%

Rosgen's Channel Type Frequency:
  - Channel Type A: 12.5%
  - Channel Type B: 78.1%
  - Channel Type C: 9.4%
  - Channel Type D:

Percent Pools with $\geq 35\%$ Embeddedness: 61.6%

Average Channel Gradient: 5.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Killenger Creek

Number of Pieces per Kilometer

- Total: 557.1
- > 5 m > 55 cm: 198.1
- > 5 m < 55 cm: 344.3
- < 5 m > 55 cm: 9.9
- < 5 m < 55 cm: 6.8
Distribution and Abundance of Large Woody Debris

Number of Pieces

Total LWD

LWD > 5 m > 55 cm

Distance (m)

Killenger Creek
Riparian Width
Stream: Killenger Creek
Number of Measurements: 6
Mean Width: 17.1m  Std Dev: 6.4
Max: 29.3m  Min: 10.8m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Killenger Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat
Killenger Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)

0 250 500 750 1000 1250 1500 1750 2000 2250
Stream: Kinser Creek
District: Mount Rogers National Recreation Area
Quadrangle: Cedar Springs/Speedwell
Sample Date: 07/22/98
Downstream Starting Point: Forest Service Boundary
Total Distance Surveyed: 0.6 kilometers

Percent of Total Area - Pools: 56.0%
Number of Pools: 46
Number of Pools per kilometer: 76.7
Total Pool Area: 868.0 sq. meters ± 61.9
Mean Pool Area: 18.9 sq. meters
Correction Factor: 1.00
Mean Maximum Depth: 25.1 cm
Mean Average Depth: 13.9 cm
Mean Average Residual Pool Depth: 9.7 cm
Percent of Total Area - Riffles: 44.0%
Number of Riffles: 20
Number of Riffles per kilometer: 33.3
Total Riffle Area: 681.0 sq. meters ± 180.3
Mean Riffle Area: 34.1 sq. meters
Correction Factor: 1.08
Mean Maximum Depth: 15.8 cm
Mean Average Depth: 8.3 cm

Number of Large Woody Debris Pieces per kilometer: 105.4
Wood < 5 m and < 55 cm: 75.8
Wood < 5 m and > 55 cm: 0.0
Wood > 5 m and < 55 cm: 26.3
Wood > 5 m and > 55 cm: 3.3

Mean Channel Width: 6.0 m
Mean Riparian Width: 13.2 m
Mean Maximum Riparian Distance (either side): 4.8 m
Mean Minimum Riparian Distance (either side): 2.4 m
Maximum Riparian Width (Total): 16.0 m
Minimum Riparian Width (Total): 10.4 m
Kinser Creek Continued.

**Percent of Pool Habitat Surveyed as Glides:** 21.8%

**Rosgen’s Channel Type Frequency:**
- Channel Type A: 5.9%
- Channel Type B: 88.2%
- Channel Type C: 5.9%
- Channel Type D:

**Percent Pools with ≥ 35% Embeddedness:** 30.4%

**Average Channel Gradient:** 7.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Kinser Creek

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number of Pieces per Kilometer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>105.4</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>3.3</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>26.3</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>0.0</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>75.5</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

Number of Pieces

Distance (m)

Total LWD

Kinser Creek

LWD > 5 m > 55 cm
Riparian Width
Stream: Kinser Creek
Number of Measurements: 4
Mean Width: 13.2m  Std Dev: 2.5
Max: 16.0m  Min: 10.4m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Kinser Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

Pool Area
56.0%

Riffle Area
44.0%

30%

70%
Kinser Creek
Rosgen's Channel Type Distribution
Stream: Middle Creek
District: Mount Rogers National Recreation Area
Quadrangle: Cedar Springs
Sample Date: 07/21/98
Downstream Starting Point: Forest Service Boundary on FS Road 16
Total Distance Surveyed: 1.4 kilometers
  Percent of Total Area - Pools: 39.2%
  Number of Pools: 77
  Number of Pools per kilometer: 55.0
  Total Pool Area: 1138.1 sq. meters + 255.5
  Mean Pool Area: 14.8 sq. meters
  Correction Factor: 1.02
  Mean Maximum Depth: 36.7 cm
  Mean Average Depth: 20.8 cm
  Mean Average Residual Pool Depth: 16.1 cm
  Percent of Total Area - Riffles: 60.8%
  Number of Riffles: 57
  Number of Riffles per kilometer: 40.7
  Total Riffle Area: 1764.9 sq. meters + 167.2
  Mean Riffle Area: 31.0 sq. meters
  Correction Factor: 0.96
  Mean Maximum Depth: 17.3 cm
  Mean Average Depth: 7.3 cm

Number of Large Woody Debris Pieces per kilometer: 379.2
  Wood < 5 m and < 55 cm: 195.5
  Wood < 5 m and > 55 cm: 18.0
  Wood > 5 m and < 55 cm: 143.5
  Wood > 5 m and > 55 cm: 22.2

Mean Channel Width: 7.0 m
Mean Riparian Width: 16.4 m
  Mean Maximum Riparian Distance (either side): 7.6 m
  Mean Minimum Riparian Distance (either side): 1.8 m
  Maximum Riparian Width (Total): 26.2 m
  Minimum Riparian Width (Total): 12.2 m
Middle Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 16.4%

Rosgen's Channel Type Frequency:
  Channel Type A: 61.0%
  Channel Type B: 39.0%
  Channel Type C:
  Channel Type D:

Percent Pools with > 35% Embeddedness: 31.2%

Average Channel Gradient: 8.0
Middle Creek

Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Middle Creek

Large Woody Debris

- Total: 379.2
- > 5 m > 55 cm: 22.2
- > 5 m < 55 cm: 143.5
- < 5 m > 55 cm: 18.0
- < 5 m < 55 cm: 195.5

Number of Pieces per Kilometer
Middle Creek
Substrate Composition

Pools

Riffles

Frequency (%)
Cumulative Percent

Frequency (%)
Cumulative Percent
Riparian Width
Stream: Middle Creek
Number of Measurements: 5
Mean Width: 16.4m  Std Dev: 5.8
Max: 26.2m    Min: 12.2m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Middle Creek
Pool:Ripple Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

Pool Area 39.2%
Ripple Area 60.8%
Middle Creek
Rosgen's Channel Type Distribution
Stream: Parks Creek
District: Mount Rogers National Recreation Area
Quadrangle: Cedar Springs/Middle Fox Creek
Sample Date: 07/15/98
Downstream Starting Point: Confluence with Cressy Creek

Total Distance Surveyed: 1.4 kilometers

Percent of Total Area - Pools: 42.3%
Number of Pools: 113
Number of Pools per kilometer: 80.7
Total Pool Area: 1292.6 sq. meters ± 118.49
Mean Pool Area: 11.4 sq. meters
Correction Factor: 1.08
Mean Maximum Depth: 34.5 cm
Mean Average Depth: 22.8 cm
Mean Average Residual Pool Depth: 17.6 cm

Percent of Total Area - Riffles: 57.7%
Number of Riffles: 64
Number of Riffles per kilometer: 45.7
Total Riffle Area: 1762.7 sq. meters ± 573.8
Mean Riffle Area: 27.5 sq. meters
Correction Factor: 1.01
Mean Maximum Depth: 20.1 cm
Mean Average Depth: 9.5 cm

Number of Large Woody Debris Pieces per kilometer: 96.5
Wood < 5 m and < 55 cm: 60.6
Wood < 5 m and > 55 cm: 3.7
Wood > 5 m and < 55 cm: 30.7
Wood > 5 m and > 55 cm: 1.5

Mean Channel Width: 6.3 m
Mean Riparian Width: 15.2 m
Mean Maximum Riparian Distance (either side): 7.9 m
Mean Minimum Riparian Distance (either side): 1.0 m
Maximum Riparian Width (Total): 7.9 m
Minimum Riparian Width (Total): 1.0 m
Parks Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 28.0%

Rosgen's Channel Type Frequency:

Channel Type A: 68.0%
Channel Type B: 32.0%
Channel Type C:
Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 27.4%

Average Channel Gradient: 10.7
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Parks Creek

![Bar graph showing the number of large woody debris pieces per kilometer for different size categories. The categories are: Total, > 5 m > 55 cm (1.5), > 5 m < 55 cm (30.7), < 5 m > 55 cm (3.7), < 5 m < 55 cm (96.5). The DFC category is shaded and has a value of 180.]
Distribution and Abundance of Large Woody Debris

Parks Creek

Number of Pieces

Distance (m)

Total LWD

LWD > 5 m > 55 cm
Riparian Width
Stream: Parks Creek
Number of Measurements: 3
Mean Width: 15.2m  Std Dev: 9.4
Max: 26.0m  Min: 9.4m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Parks Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat
Parks Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)

C
B
A
Speedwell Quadrangle
Stream: East Fork Dry Run
District: Mount Rogers National Recreation Area
Quadrangle: Speedwell
Sample Date: 07/23/98
Downstream Starting Point: Junction with West Fork Dry Run
Total Distance Surveyed: 3.4 kilometers
  Percent of Total Area - Pools: 52.9%
  Number of Pools: 132
  Number of Pools per kilometer: 39.7
  Total Pool Area: 4922.8 sq. meters ± 601.9
  Mean Pool Area: 37.3 sq. meters
  Correction Factor: 1.12
  Mean Maximum Depth: 43.1 cm
  Mean Average Depth: 28.8 cm
  Mean Average Residual Pool Depth: 22.7 cm
  Percent of Total Area - Riffles: 47.1%
  Number of Riffles: 81
  Number of Riffles per kilometer: 23.8
  Total Riffle Area: 4379.5 sq. meters ± 515.7
  Mean Riffle Area: 54.1 sq. meters
  Correction Factor: 1.12
  Mean Maximum Depth: 15.6 cm
  Mean Average Depth: 8.8 cm
Number of Large Woody Debris Pieces per kilometer: 205.3
  Wood < 5 m and < 55 cm: 123.9
  Wood < 5 m and > 55 cm: 5.0
  Wood > 5 m and < 55 cm: 67.1
  Wood > 5 m and > 55 cm: 9.3
Mean Channel Width: 6.4 m
Mean Riparian Width: 43.5 m
  Mean Maximum Riparian Distance (either side): 33.0 m
  Mean Minimum Riparian Distance (either side): 4.1 m
  Maximum Riparian Width (Total): 101.9 m
  Minimum Riparian Width (Total): 15.5 m
East Fork Dry Run Continued.

Percent of Pool Habitat Surveyed as Glides: 14.5%

Rosgen's Channel Type Frequency:

Channel Type A:

Channel Type B: 28.8%

Channel Type C: 71.2%

Channel Type D:

Percent Pools with \( \geq 35\% \) Embeddedness: 38.6%

Average Channel Gradient: 3.9
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
East Fork Dry Run

Number of Pieces per Kilometer

<table>
<thead>
<tr>
<th>Large Woody Debris</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>205.2</td>
</tr>
<tr>
<td>&gt; 5 m &gt; 55 cm</td>
<td>9.3</td>
</tr>
<tr>
<td>&gt; 5 m &lt; 55 cm</td>
<td>67.1</td>
</tr>
<tr>
<td>&lt; 5 m &gt; 55 cm</td>
<td>4.9</td>
</tr>
<tr>
<td>&lt; 5 m &lt; 55 cm</td>
<td>124.0</td>
</tr>
</tbody>
</table>
Distribution and Abundance of Large Woody Debris

East Fork Dry Run

Number of Pieces

Distance (m)

Total LWD

LWD > 5 m > 55 cm
Riparian Width
Stream: East Fork Dry Run
Number of Measurements: 8
Mean Width: 43.5m  Std Dev: 27.3
Max: 102m  Min: 15.5m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
East Fork Dry Run
Pool:Ripple Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat

Pool Area 52.9%
Ripple Area 47.1%

30% 70%
East Fork Dry Run
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Stream: West Fork Dry Run
District: Mount Rogers National Recreation Area
Quadrangle: Speedwell
Sample Date: 07/23/98
Downstream Starting Point: Junction with East Fork Dry Run
Total Distance Surveyed: 1.2 kilometers
  Percent of Total Area - Pools: 55.6%
  Number of Pools: 60
  Number of Pools per kilometer: 50.0
  Total Pool Area: 1556.6 sq. meters ± 244.8
  Mean Pool Area: 25.9 sq. meters
  Correction Factor: 0.94
  Mean Maximum Depth: 30.7 cm
  Mean Average Depth: 15.3 cm
  Mean Average Residual Pool Depth: 12.8 cm
Percent of Total Area - Riffles: 44.4%
  Number of Riffles: 43
  Number of Riffles per kilometer: 35.8
  Total Riffle Area: 1242.3 sq. meters ± 115.5
  Mean Riffle Area: 28.9 sq. meters
  Correction Factor: 1.04
  Mean Maximum Depth: 13.8 cm
  Mean Average Depth: 5.9 cm
Number of Large Woody Debris Pieces per kilometer: 196.6
  Wood < 5 m and < 55 cm: 79.4
  Wood < 5 m and > 55 cm: 8.8
  Wood > 5 m and < 55 cm: 91.5
  Wood > 5 m and > 55 cm: 16.9
Mean Channel Width: 6.0 m
Mean Riparian Width: 26.6 m
  Mean Maximum Riparian Distance (either side): 17.3 m
  Mean Minimum Riparian Distance (either side): 3.3 m
  Maximum Riparian Width (Total): 47.2 m
  Minimum Riparian Width (Total): 11.7 m
West Fork Dry Run Continued.

Percent of Pool Habitat Surveyed as Glides: 14.2%

Rosgen's Channel Type Frequency:
  Channel Type A: 15.1%
  Channel Type B: 70.7%
  Channel Type C: 14.2%
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 46.7%

Average Channel Gradient: 15.8
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Riparian Width
Stream: West Fork Dry Run
Number of Measurements: 4
Mean Width: 26.6m  Std Dev: 16.7
Max: 47.2m  Min: 11.7m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
West Fork Dry Run
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
West Fork Dry Run
Rosgen's Channel Type Distribution

Channel Type
C
B
A

Distance (m)
0 200 400 600 800 1000 1200
Cripple Creek Quadrangle
Stream: Bournes Branch
District: Mount Rogers National Recreation Area
Quadrangle: Cripple Cr.
Sample Date: 07/28/98
Downstream Starting Point: Confluence with Brush Creek

Total Distance Surveyed: 2.6 kilometers

Percent of Total Area - Pools: 57.1%
Number of Pools: 106
Number of Pools per kilometer: 40.9
Total Pool Area: 3638.4 sq. meters + 288.2
Mean Pool Area: 34.3 sq. meters
Correction Factor: 1.05
Mean Maximum Depth: 34.6 cm
Mean Average Depth: 22.2 cm
Mean Average Residual Pool Depth: 20.8 cm

Percent of Total Area - Riffles: 42.9%
Number of Riffles: 80
Number of Riffles per kilometer: 30.9
Total Riffle Area: 2736.4 sq. meters + 125.7
Mean Riffle Area: 34.2 sq. meters
Correction Factor: 0.97
Mean Maximum Depth: 13.5 cm
Mean Average Depth: 7.2 cm

Number of Large Woody Debris Pieces per kilometer: 156.9
Wood < 5 m and < 55 cm: 97.3
Wood < 5 m and > 55 cm: 1.5
Wood > 5 m and < 55 cm: 51.2
Wood > 5 m and > 55 cm: 6.9

Mean Channel Width: 5.6 m
Mean Riparian Width: 50.6 m

Mean Maximum Riparian Distance (either side): 36.4 m
Mean Minimum Riparian Distance (either side): 8.6 m
Maximum Riparian Width (Total): 75.5 m
Minimum Riparian Width (Total): 24.8 m
Bournes Branch Continued.

Percent of Pool Habitat Surveyed as Glides: 23.9%

Rosgen's Channel Type Frequency:
  Channel Type A: 16.6%
  Channel Type B: 83.4%
  Channel Type C:
  Channel Type D:

Percent Pools with ≥ 35% Embeddedness: 50.0%

Average Channel Gradient: 4.7
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Distribution and Abundance of Large Woody Debris

Total LWD

Bournes Branch

Number of Pieces

LWD > 5 m > 55 cm

Distance (m)
Riparian Width
Stream: Bournes Branch
Number of Measurements: 4
Mean Width: 50.6m   Std Dev: 21.5
Max: 75.5m      Min: 24.8m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Bournes Branch
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area
in Pool Habitat

Pool Area 56.1%

Riffle Area 42.9%

30% 70%
Bournes Branch
Rosgen's Channel Type Distribution

Distance (m)

Channel Type
Stream: Francis Mill Creek  
District: Mount Rogers National Recreation Area  
Quadrangle: Cripple Creek  
Sample Date: 07/27/98  
Downstream Starting Point: Forest Service Boundary on FS Road 14  
Total Distance Surveyed: 4.1 kilometers  
  Percent of Total Area - Pools: 59.3%  
  Number of Pools: 219  
  Number of Pools per kilometer: 53.4  
  Total Pool Area: 6482.1 sq. meters ± 261.7  
  Mean Pool Area: 29.6 sq. meters  
  Correction Factor: 1.01  
  Mean Maximum Depth: 33.3 cm  
  Mean Average Depth: 16.9 cm  
  Mean Average Residual Pool Depth: 13.1 cm  
Percent of Total Area - Riffles: 40.7%  
  Number of Riffles: 130  
  Number of Riffles per kilometer: 31.7  
  Total Riffle Area: 4444.8 sq. meters ± 275.2  
  Mean Riffle Area: 34.2 sq. meters  
  Correction Factor: 1.07  
  Mean Maximum Depth: 13.2 cm  
  Mean Average Depth: 6.0 cm  
Number of Large Woody Debris Pieces per kilometer: 274.4  
  Wood < 5 m and < 55 cm: 103.7  
  Wood < 5 m and > 55 cm: 8.6  
  Wood > 5 m and < 55 cm: 132.3  
  Wood > 5 m and > 55 cm: 29.8  
Mean Channel Width: 6.3 m  
Mean Riparian Width: 32.9 m  
  Mean Maximum Riparian Distance (either side): 23.2 m  
  Mean Minimum Riparian Distance (either side): 3.4 m  
  Maximum Riparian Width (Total): 71.4 m  
  Minimum Riparian Width (Total): 8.4 m
Box plots representing maximum and average depths for pools and riffles, and average residual pool depths for this stream. The boxes enclose the middle 50% of the observations, the bar in the center of the boxes represent the median, and the capped lines extending above and below the boxes represent the 90% and 10% quantiles.
Francis Mill Creek Continued.

Percent of Pool Habitat Surveyed as Glides: 10.2%

Rosgen's Channel Type Frequency:
- Channel Type A: 48.5%
- Channel Type B: 34.8%
- Channel Type C: 16.7%
- Channel Type D:

Percent Pools with \( \geq 35\% \) Embeddedness: 45.2%

Average Channel Gradient: 3.4
Francis Mill Creek

Number of Pieces per Kilometer

Large Woody Debris

Total

> 5 m > 55 cm - 29.8

> 5 m < 55 cm - 132.3

< 5 m > 55 cm - 8.6

< 5 m < 55 cm - 103.7

DFC - 274.4
Distribution and Abundance of Large Woody Debris

Francis Mill Creek

Number of Pieces

Distance (m)

LWD > 5 m > 55 cm
Francis Mill Creek
Substrate Composition

Pools

Riffles
Riparian Width
Stream: Francis Mill Creek
Number of Measurements: 12
Mean Width: 32.8m  Std Dev: 22.9
Max: 71.4m   Min: 8.4m

Box plot of total riparian width. The box encloses the middle 50% of the observations, the bar in the center of the box represents the median, and the capped lines extending above and below the box represent the 90% and 10% quantiles.
Francis Mill Creek
Pool:Riffle Ratio
DFC: 30 - 70% of the Stream Area in Pool Habitat
Francis Mill Creek
Rosgen's Channel Type Distribution

Channel Type

Distance (m)
Appendix 1a. Substrate classification criteria.

**SUBSTRATE CLASSES**

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>1</td>
<td>organic debris</td>
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<tr>
<td>2</td>
<td>clay</td>
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<tr>
<td>3</td>
<td>silt</td>
</tr>
<tr>
<td>4</td>
<td>silt-2mm sand</td>
</tr>
<tr>
<td>5</td>
<td>2-10mm small gravel</td>
</tr>
<tr>
<td>6</td>
<td>1-10cm large gravel</td>
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<tr>
<td>7</td>
<td>11-30cm cobble</td>
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<tr>
<td>8</td>
<td>30cm boulder</td>
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<tr>
<td>9</td>
<td>bedrock</td>
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Appendix 1b. Large woody debris (LWD) classification criteria.

**LWD SIZE CLASSES**

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<thead>
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<tbody>
<tr>
<td>1</td>
<td>&lt; 5 m (length) and &lt; 55 cm (diameter)</td>
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<tr>
<td>2</td>
<td>&lt; 5 m (length) and &gt; 55 cm (diameter)</td>
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<tr>
<td>3</td>
<td>&gt; 5 m (length) and &lt; 55 cm (diameter)</td>
</tr>
<tr>
<td>4</td>
<td>&gt; 5 m (length) and &gt; 55 cm (diameter)</td>
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Appendix 1c. Rosgen's channel type criteria, table from Rosgen 1996.

<table>
<thead>
<tr>
<th>Stream Type</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>DA</th>
<th>E</th>
<th>F</th>
<th>G</th>
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<tr>
<td>Entrainment</td>
<td>&lt; 1.4</td>
<td>1.4 - 2.2</td>
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<td>&gt; 2.2</td>
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<td>Sinuosity</td>
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<td>variable</td>
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<td>Slope</td>
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<td>.02 - .039</td>
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<td>&lt; .005</td>
<td>&lt; .02</td>
<td>&lt; .02</td>
<td>.02 - .039</td>
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Appendix 1d. Streams present on the MRNRA that were not sampled due to either low water or dry conditions.

<table>
<thead>
<tr>
<th>Stream</th>
<th>Quadrangle</th>
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<tr>
<td>Charlie's Branch</td>
<td>Whitetop Mtn.</td>
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<td>Grindstone Branch</td>
<td>Whitetop Mtn.</td>
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<tr>
<td>West Fork Hopkins Branch</td>
<td>Whitetop Mtn.</td>
</tr>
<tr>
<td>Quebec Branch</td>
<td>Whitetop Mtn.</td>
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<tr>
<td>St. Clair Creek</td>
<td>Whitetop Mtn.</td>
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<tr>
<td>Mill Creek</td>
<td>Troutdale</td>
</tr>
<tr>
<td>Jones Creek</td>
<td>Speedwell</td>
</tr>
<tr>
<td>Brier Run</td>
<td>Troutdale</td>
</tr>
<tr>
<td>No Name Branch</td>
<td>Atkins/TROUTDALE</td>
</tr>
<tr>
<td>Middle Fox Creek</td>
<td>Middle Fox Creek</td>
</tr>
<tr>
<td>Crigger Creek</td>
<td>Cedar Springs</td>
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<tr>
<td>Little Dry Run</td>
<td>Speedwell</td>
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<tr>
<td>Turkey Fork</td>
<td>Speedwell</td>
</tr>
<tr>
<td>Waddle Hollow</td>
<td>Atkins</td>
</tr>
<tr>
<td>Overbay Hollow</td>
<td>Atkins</td>
</tr>
<tr>
<td>Quarter Branch</td>
<td>Atkins</td>
</tr>
<tr>
<td>Laurel Hollow Branch</td>
<td>Speedwell</td>
</tr>
<tr>
<td>Lick Creek</td>
<td>Cripple Creek</td>
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<tr>
<td>Big Branch</td>
<td>Austinsville</td>
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<tr>
<td>Big Branch</td>
<td>Whitetop Mtn.</td>
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<tr>
<td>Buzzard Den (@ Widener Springs)</td>
<td>Konnarock</td>
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</tbody>
</table>