

Chambers Watershed, TX

Base Level Engineering (BLE) Results

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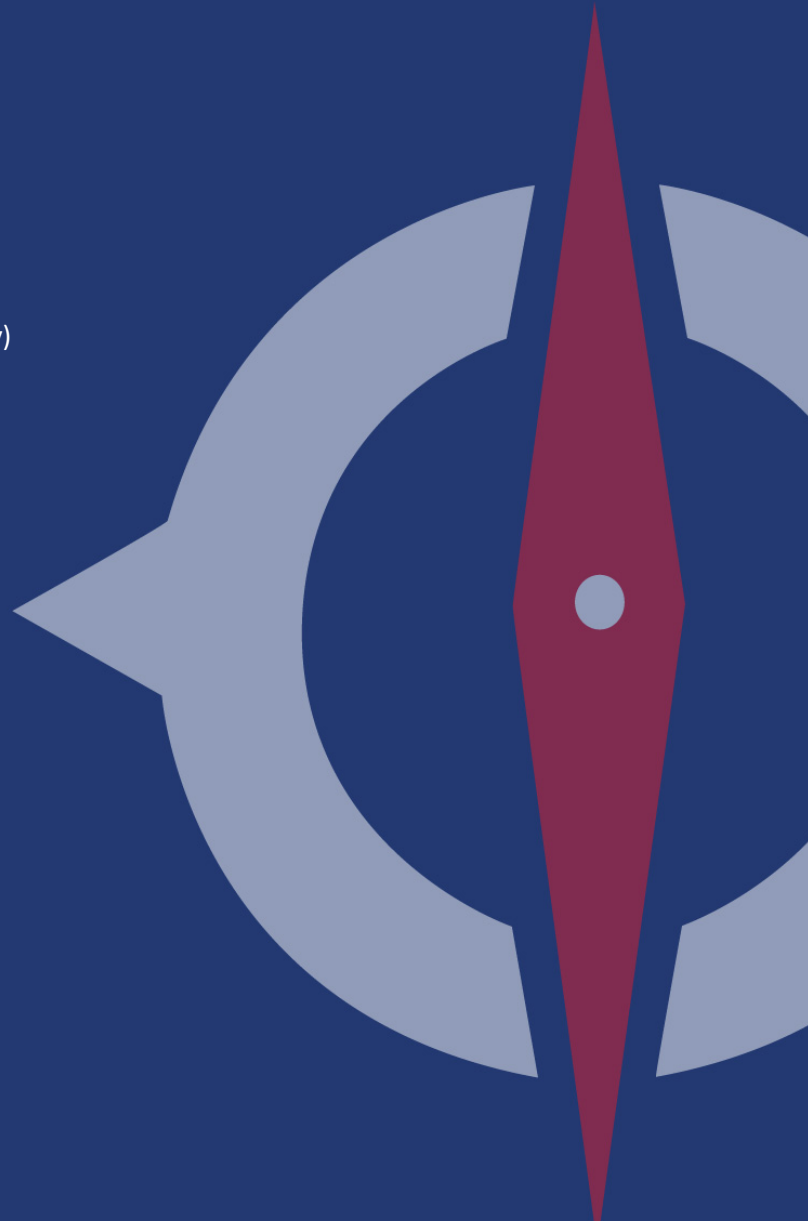
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Prepared for:

DHS/FEMA (Federal Emergency Management Agency)
Region VI
FRC 800 North Loop 288
Denton, TX 76209-3698

Submitted by:

Compass PTS JV
3101 Wilson Boulevard
Suite 900
Arlington, VA 22201



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APPROVALS

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Executive Summary

FEMA Region VI contracted Compass to complete a Base Level Engineering (BLE) analysis for the Chambers Watershed in East Central Texas, to support FEMA's Discovery process and validation of effective Zone A Special Flood Hazard Area (SFHA). The BLE process involves using best available data and incorporating automated techniques with traditional model development procedures to produce regulatory quality flood hazard boundaries for the 1-percent annual chance event as well as estimates of flood hazard boundaries for multiple recurrence intervals.

The source digital terrain data used for surface model development in support of hydrologic and hydraulic (H&H) analysis as well as mapping activities were leveraged from Texas Natural Resources Information System (TNRIS) and supplemented with USGS National Elevation Dataset (NED) as appropriate. The TNRIS terrain dataset was 2013 1-meter gridded DEM data derived from Light Detection and Ranging (LiDAR) data, while the USGS NED 1/3 Arc Second DEM was approximately 10-meter equivalent.

Flood discharges for this study were calculated using both USGS regression equations and gage analysis, where stream gages with sufficient records exist. Regression Equations obtained from the Scientific Investigations Report (SIR) 2009-5087, Regression Equations for Estimation of Annual Peak-Streamflow Frequency for Undeveloped Watersheds in Texas Using an L-moment-Based, PRESS-Minimized, Residual-Adjusted Approach (2009) were used while PeakFQ version 7.1 was used to perform Flood Frequency Analysis (FFA) for the two gages in the Chambers watershed.

The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program version 4.1 was used to compute water surface elevations on a stream by stream basis. All hydraulic models were computed using 1-D steady state analysis.

The stream mile network that was validated for Chambers Watershed was compiled using FEMA's CNMS inventory in conjunction with the National Hydrography Dataset (NHD) 24K High Resolution. Table ES-1 lists the stream miles identified by each source for this BLE validation analysis.

Table ES-1. Summary of Stream Miles

Source	Chambers Stream Miles
CNMS	1,177.5
Total	1,177.5

The full inventory of Zone A studies (1,177 miles) in the Chambers Watershed were classified in CNMS with a validation status of "UNKNOWN" and status type of "TO BE ASSESSED." Total miles validated in CNMS are summarized in Table ES-2 and illustrated in Figure ES-1 below.

Table ES-2: Zone A Validation Results

Validation Status	Status Type	Total Miles
VALID	NVUE COMPLIANT	30.13
UNVERIFIED	TO BE STUDIED	1,147.37

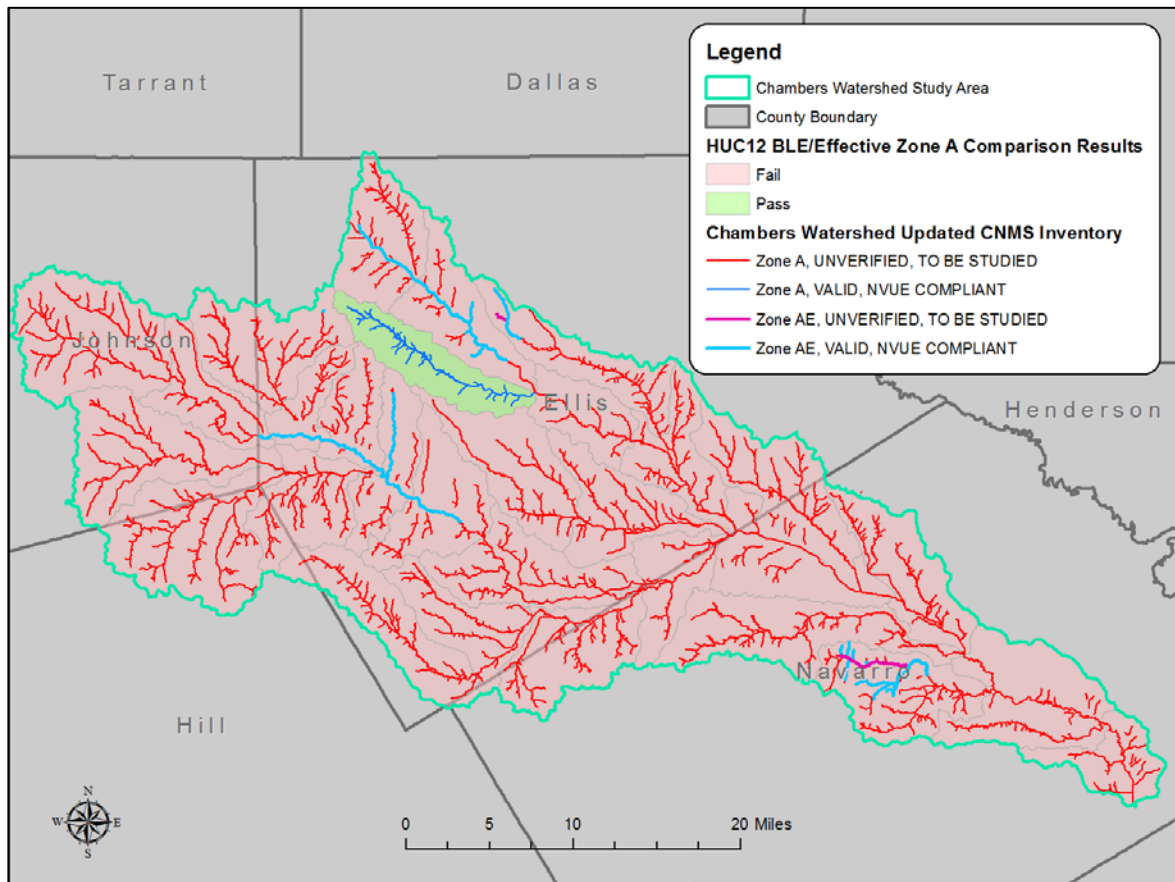


Figure ES-1. Chambers Watershed CNMS Validation Results

An overall risk for each HUC-12 watershed was calculated using the National Flood Risk Percentages Dataset and its proportional area. The weighted risk was multiplied by the percentage of points in the watershed that failed the CNMS comparison to effective to determine the priority score. Figure ES-2 below shows the range of the Chambers HUC-8 priority scores which can be used to initiate discussions during the Discovery phase. Lower Waxahachie Creek HUC-12 was determined to have the highest priority score and the most need while South Prong Creek – Lake Waxahachie HUC-12 has the lowest score.

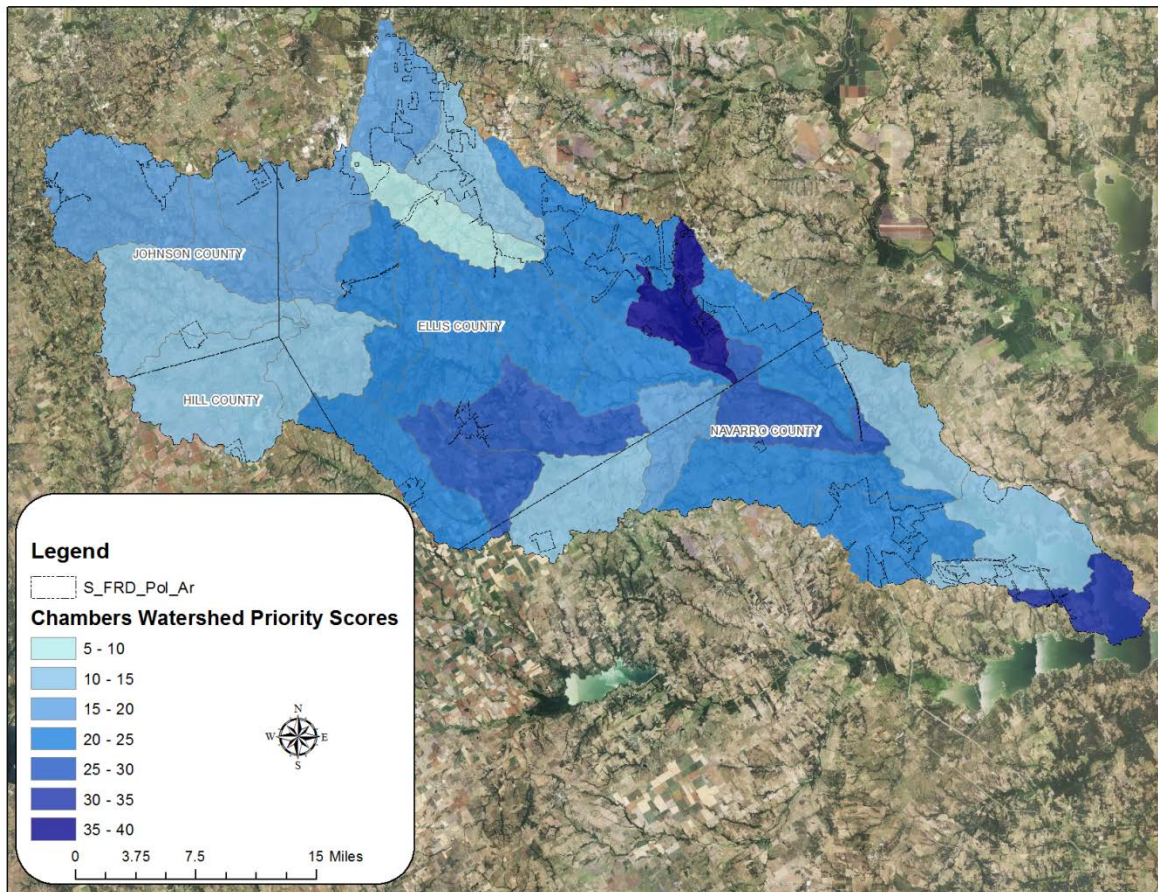


Figure ES-2. Ranking of Chambers Watershed HUC-12s



Base Level Engineering (BLE) Methodology

Recent innovations and efficiencies in floodplain mapping have allowed the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) to develop a process called Base Level Engineering (BLE), which can be used to address current program challenges, including the validation of Zone A studies and the availability of flood risk data in the early stages of a Flood Risk Project. The BLE process involves using best available data and incorporating automated techniques with traditional model development procedures to produce regulatory quality flood hazard boundaries for the 1-percent annual chance event as well as estimates of flood hazard boundaries for multiple recurrence intervals. The cost for developing the data and estimates resulting from the BLE process are lower than standard flood production costs. The BLE results may be used for eventual production of regulatory and non-regulatory products.

As described in Title 42 of the Code of Federal Regulations, Chapter III, Section 4101(e), once every five years, FEMA must evaluate whether the information on Flood Insurance Rate Maps (FIRMs) reflects the current risks in floodprone areas. FEMA makes this determination of flood hazard data validity by examining flood study attributes and change characteristics, as specified in the Validation Checklist of the Coordinated Needs Management Strategy (CNMS) Technical Reference. The CNMS Validation Checklist provides a series of critical and secondary checks to determine the validity of flood hazard areas studied by detailed methods (e.g., Zone AE, AH, or AO). While the critical and secondary elements in CNMS provide a comprehensive method of evaluating the validity of Zone AE studies, a cost-effective approach for evaluating Zone A studies has been lacking.

In addition to the need for Zone A validation guidance, FEMA standards require flood risk data to be provided in the early stages of a Flood Risk Project. FEMA Program Standard SID #29 requires that during Discovery, data must be identified that illustrates potential changes in flood elevation and mapping that may result from the proposed project scope. If available data does not clearly illustrate the likely changes, an analysis is required that estimates the likely changes. This data and any associated analyses should be shared and results should be discussed with stakeholders.

An important goal of the BLE process is the scalability of the results. Scalability means that the results of a BLE analysis can not only be used for CNMS evaluations of Zone A studies, but can also be leveraged throughout the Risk MAP program. The data resulting from a BLE analysis can be updated as needed and used for the eventual production of regulatory and non-regulatory products, outreach and risk communication, and MT-1 processing. Leveraging this data outside the Risk MAP program may also be valuable to external stakeholders.

FEMA Region VI contracted Compass to complete a BLE analysis for the Chambers Watershed in East Central Texas, to support FEMA's Discovery process and validation of effective Zone A Special Flood Hazard Area (SFHA). The study extents include portions of Ellis, Hill, Johnson and Navarro Counties and include the following communities: Cities of Alvarado, Bardwell, Blooming Grove, Burleson, Cedar Hill, Corsicana, Ennis, Eureka, Frost, Garrett, Grandview, Italy, Itasca, Keene, Maypearl, Midlothian, Milford, Retreat, Rice, Venus, and Waxahachie and the Towns of Alma, Emhouse, Mildred, and Powell. The study area consisted of four HUC-10 basins: North Fork Chambers Creek, Upper Chambers Creek, Lower Chambers Creek, and Waxahachie Creek. Figure 1 shows the orientation of the Chambers Creek HUC-10 basins with respect to the counties.

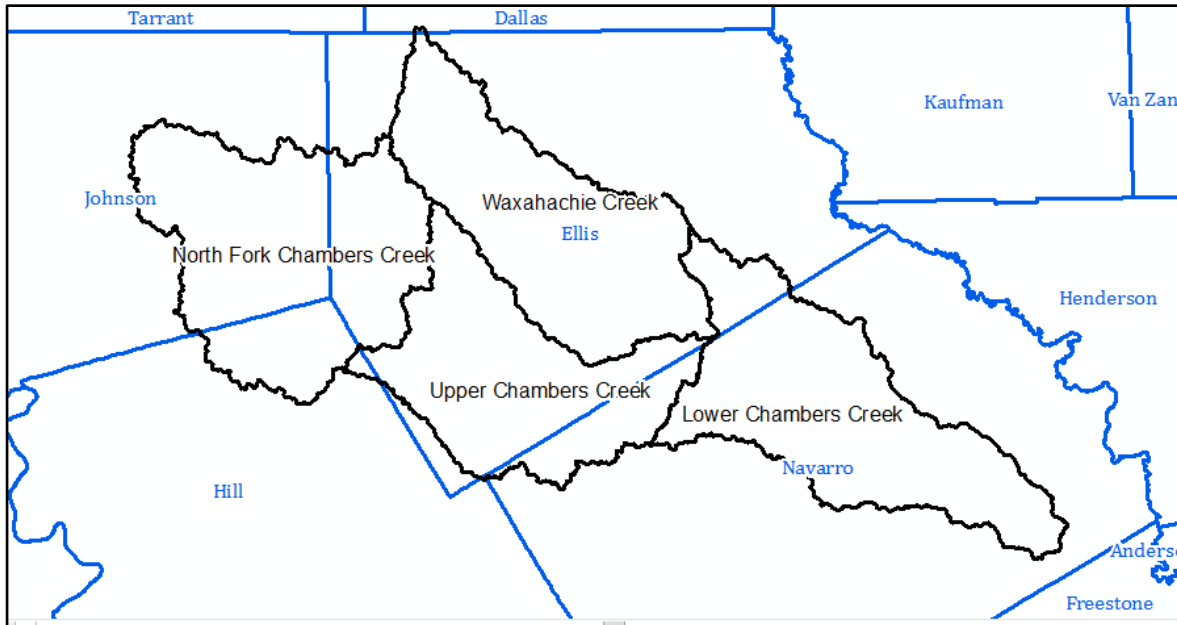


Figure 1. Chambers Watershed HUC-10 Basins

Compass studied approximately 1,177 miles of stream reaches within the Chambers Watershed with a minimum drainage area tolerance of one square mile. The selection and extent of stream reaches studied was based upon the number of stream miles with minimum drainage area of one square mile and not the number of effective Zone A stream miles. Study reaches were extended above this one square mile threshold as appropriate to ensure all effective Zone A floodplain received an updated analysis. Topographic data available from the United States Geologic Survey (USGS) was used to determine the hydrologic and hydraulic characteristics of the watershed. The following sections will summarize the BLE process and will discuss the results along with their recommended use.

1.1 Topographic Data

The source digital terrain data used for surface model development in support of hydrologic and hydraulic (H&H) analysis as well as mapping activities were leveraged from Texas Natural Resources Information System (TNRIS) and supplemented with USGS National Elevation Dataset (NED) as appropriate. The leveraged TNRIS DEM data consisted of 2013 1-meter gridded DEM data derived from Light Detection and Ranging (LiDAR) data. The USGS NED 1/3 Arc Second DEM (approximately 10-meter equivalent) was used to provide a buffer along the northeastern ridge line and around the southern extent of the Chambers-Chambers Reservoir as a buffer to the HUC-10 watersheds. Figure 2 shows the extent of the TNRIS LiDAR data.

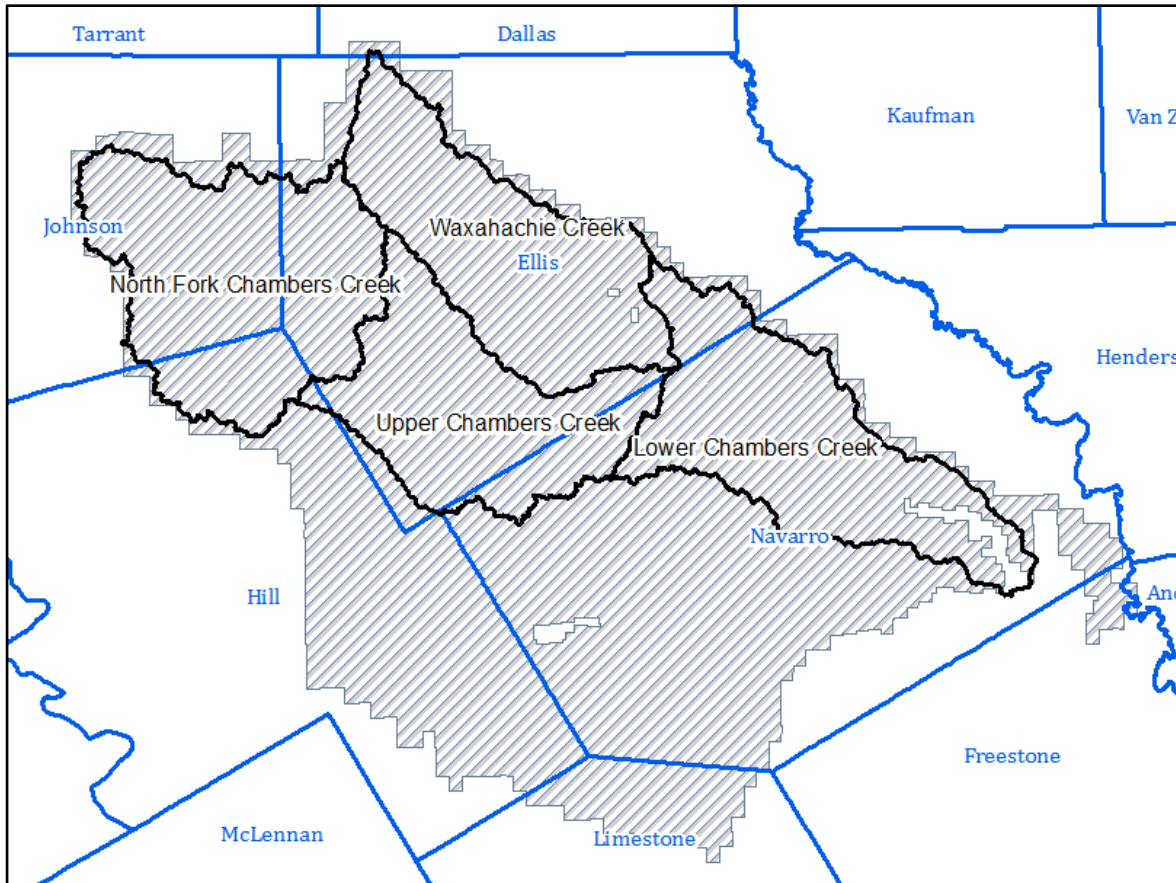


Figure 2. Extent of LiDAR Data

A new composite surface of the combined source topographic datasets, a seamless Triangular Irregular Network (TIN), was constructed using the WISE (Watershed Information System) Terrain Analyst tools. The TNRIS DEM data were used as the primary data source for the TIN while the 10-meter DEM was the secondary data source where TNRIS data did not exist for adequate buffer of the project area. A 10-foot DEM was sampled from the composite TIN and was used as the primary source for cross section takeoffs supporting hydraulic analyses. This 10-foot DEM was also used for visual QC and to support floodplain mapping tasks. A 50-foot DEM was sampled from the TIN for hydro enforcement to support hydrology tasks including flow vector and basin delineation.

Root Mean Square Error (RMSE) was calculated on the leveraged LiDAR-derivative DEM data used in this BLE analysis. The vertical accuracy of the source DEMs was calculated using QC checkpoints for the entire Chambers/Chambers project area from original LiDAR QC reports acquired with the TNRIS data. The entire project area tested at 3.77 centimeters (cm) RMSEz, well within the 12.5 cm FEMA requirement for leveraged topographic data.

In addition to the quantitative assessment of the source digital terrain, a qualitative visual inspection of the composite DEM was performed using a hillshade derived from the 10-foot DEM. The visual inspection indicated no unusual or non-terrestrial features were observed in the



composite DEM assuring the surface files used for H&H and floodplain mapping activities are sufficient for BLE analysis.

1.2 Hydrology

Flood discharges for this study were calculated using both USGS regression equations and gage analysis, where stream gages with sufficient records exist. Scientific Investigations Report (SIR) 2009-5087, Regression Equations for Estimation of Annual Peak-Streamflow Frequency for Undeveloped Watersheds in Texas Using an L-moment-Based, PRESS-Minimized, Residual-Adjusted Approach (2009) contains the most recent regression equations for Texas and was used as the basis for regression calculations.

The WISE computer program was used to delineate drainage basins in shapefile format using the 50-foot resolution DEM. WISE was used to calculate the main-channel slope for each basin. The basin shapefile attribution was automated by WISE with drainage area and main-channel slope.

In order to perform the regression analysis and attribute each basin with appropriate discharge values, a script was written in Python and run in ESRI's ArcCatalog. This script required input of drainage area and main-channel slope (from WISE), as well as mean annual precipitation and OmegaEM.

PeakFQ version 7.1 was used to perform Flood Frequency Analysis (FFA) for two gages in the Chambers watershed.

Table 1 shows the published equations that were used for this study. In these equations, Q_i represents peak streamflow for i -recurrence interval (annual chance exceedance (a.c.e.)) in cubic feet per second, P represents mean annual precipitation in inches, S represents dimensionless main-channel slope, Ω represents the OmegaEM parameter, and A is cumulative drainage area in square miles.



Table 1. Summary of Regression Equations (SIR 2009-5087)

Recurrence Interval	Equation ¹
Q _{10%}	$P^{1.203} S^{0.403} \times 10^{[0.918 \Omega + 13.62 - 11.97A^{(-0.0289)}]}$
Q _{4%}	$P^{1.140} S^{0.446} \times 10^{[0.945 \Omega + 11.79 - 9.819A^{(-0.0374)}]}$
Q _{2%}	$P^{1.105} S^{0.476} \times 10^{[0.961 \Omega + 11.17 - 8.997A^{(-0.0424)}]}$
Q _{1%}	$P^{1.071} S^{0.507} \times 10^{[0.969 \Omega + 10.82 - 8.448A^{(-0.0467)}]}$
Q _{0.2%}	$P^{0.988} S^{0.569} \times 10^{[0.976 \Omega + 10.40 - 7.605A^{(-0.0554)}]}$
¹ Variables: Q _i peak flow for i recurrence interval (a.c.e.), in cubic feet per second; P, Mean Annual Precipitation in Inches; S, Main-channel slope (dimensionless); Ω, OmegaEM parameter; A, Cumulative Drainage Area in square miles	

Discharges for the 1-percent plus and 1-percent minus a.c.e. were calculated as well. These values were computed by multiplying the Q_{1%} discharges by 0.30log10, which is the mean residual standard error for the Q_{1%} equation.

The mean annual precipitation values were determined based on a shapefile coverage obtained from the Texas Water Development Board and available for download from the following location: http://www.twdb.texas.gov/mapping/gisdata/doc/Precipitation_Shapefile.zip

The annual precipitation values reflect data for the climatological period 1981-2010 as recorded by the Natural Resources Conservation Service (NRCS).

Main channel slope was calculated in WISE. An automated routine was used to determine the longest flowpath from the upstream of a reach to the outlet of the sub-basin of interest based on flowpaths developed from the 50-foot DEM. Once the length of the flowpath was delineated, elevations for the endpoints were determined based on the TIN developed from the LiDAR. The slope was calculated by dividing the fall by the reach distance and the result was reported in foot/foot.

From USGS SIR 2009-5087, the OmegaEM parameter is a generalized terrain and climate index that expresses relative differences in peak-streamflow potential. A shapefile was developed and populated with OmegaEM values based on Figure 2 in SIR 2009-5087. This shapefile was used, along with a python script in ArcCatalog, to determine OmegaEM values on a sub-basin basis. For sub-basins that are split, the dominant OmegaEM value for the sub-basin was used.

Drainage area for each sub-basin was determined based on automated basin delineations performed in WISE. Basin break points were set by the user with a sub-basin target of one square mile in size. This criterion was adjusted for streams with larger drainage areas in order to avoid excessive and unnecessary discharge breaks. Break points were also set just upstream of stream



confluences. Cumulative drainage area was determined based on these automated delineations performed by WISE in combination with a stream connectivity routine that defined the stream reach segments with upstream and downstream neighbors.

As discussed in previously, a Python script in ArcCatalog was used to compute discharges for each sub-basin. The sub-basin shapefile was attributed with the computed discharges as part of the automated script. From the sub-watershed basin shapefile the discharges were incorporated into the HEC-RAS models using an automated routine in WISE. Discharges, as well as water surface elevation results, were associated with the hydraulic cross sections prior to generation of floodplain boundaries and grid mapping. Those results are available in GIS format as part of this BLE submittal package.

While BLE analysis was not performed in areas with effective discharge data available, it was possible to compare the hydrologic results at transition points between effective and BLE studies. At these locations, the general trend showed that the effective discharges were significantly higher than the discharges computed using regression equations and gage analysis.

The peak discharges on Chambers Watershed are attenuated by the combined effect of several flood control reservoirs in the headwaters of the sub-basin. These reservoirs are on the main stem as well as several tributary streams. As a result of the peak attenuation, the USGS regression equations likely over predict the a.c.e. flows for Chambers Creek as well as study segments on tributaries to Chambers Creek that are downstream of flood control impoundments.

Two USGS stream gages in the Chambers HUC-8 watershed listed in Table 2 were used to determine the a.c.e. flows for Chambers Creek. The record for the period since the beginning of regulation in 1962 was examined in order to determine the a.c.e. flows under the existing regulated conditions.

Table 2: USGS Stream Gages Used in Analysis

Gage ID	Flooding Source and Location	Computed Drainage Area (mi ²)	Published Drainage Area (mi ²)	Period of Record
08064100	Chambers Creek near Rice, TX	803	807	1984 - 2014
08064500	Chambers Creek near Corsicana, TX	959	963	1913, 1939-1984

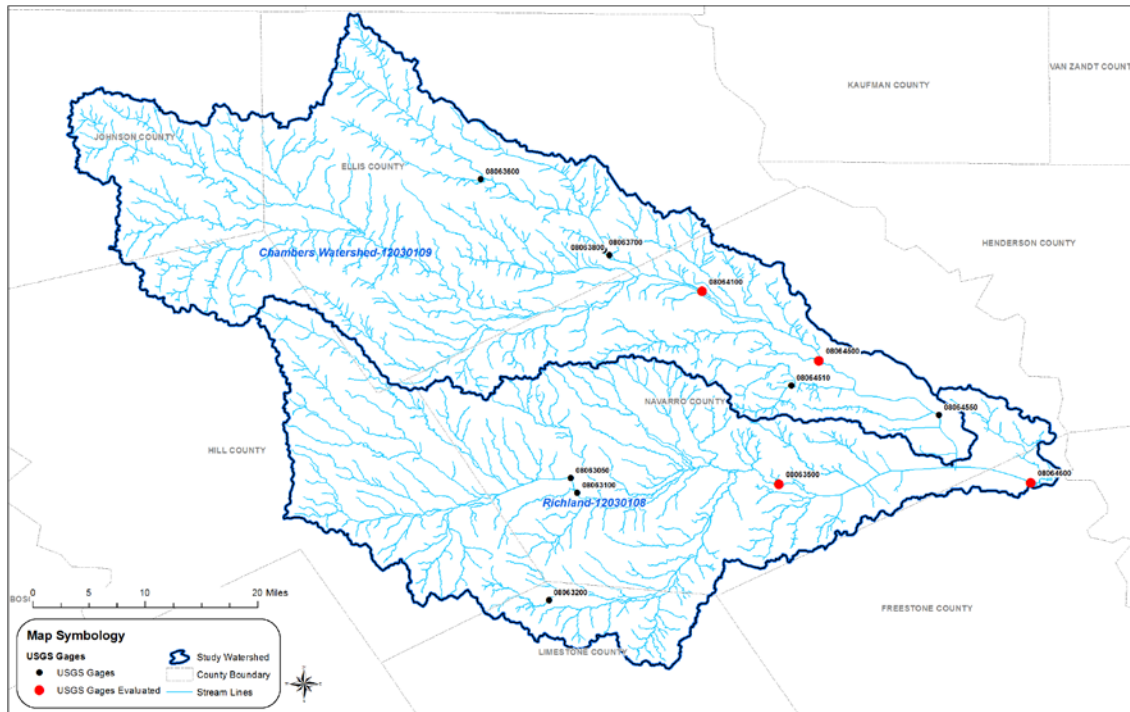


Figure 3. USGS Gage Stations within Chambers and Richland Watersheds

The two stream gages on Chambers Creek, near Rice (08064100) and near Corsicana (08064500) are at similar drainage areas and have a combined period of record of 54 years (1961-2014) that spans the entire regulated period.

Flood Frequency Analyses (FFA) were performed following Bulletin 17B guidelines for the 2 gages on Chambers Creek (08064100, 08064500).

Similar to the regression analysis results, the discharges used on these streams are associated with the hydraulic cross sections in the GIS shapefiles. For the portion of Chambers Creek downstream of the confluence with Waxahachie Creek, the computed discharges for the gages are used with no adjustment. Computed discharges for gage 08064100 are used upstream of the confluence of Tupelo Branch with discharges from 08064500 used downstream of this confluence. For the portion of Chambers Creek upstream of the confluence with Waxahachie Creek, gage computations were disregarded. The discharges for this reach were adopted from the effective FIS for Ellis County and since the discharges reported in the FIS are higher than those computed at the downstream gages, a constant discharge value was used for the entire reach.

In addition to the gages listed above, there are several stage only gages which were used for reference only as a reasonability check on lake elevations. No gage analysis was performed for Gage ID 08063800, Waxahachie Creek near Bardwell, TX. This gage is located just downstream of Bardwell Lake which is regulated.

It should be noted that throughout the watershed there are a significant number of flood control dams on tributaries to Chambers Creek and Waxahachie Creek. Hydrologic results were not adjusted to take into account the impact of these structures.



1.3 Hydraulics

The hydraulic approach for BLE analysis for the Chambers watershed consisted of using the terrain model described in section 1.1 in combination with hydrology input computed as described in section 1.2 to establish water surface elevations using 1-D steady state analysis. The Hydrologic Engineering Center's River Analysis System (HEC-RAS) program version 4.1 was chosen as the computer model to compute water surface elevations on a stream by stream basis. The WISE computer program was used to establish model stream orientation, initial hydraulic cross section layout and stationing, assign n-values to cross sections, and to develop all input files for the HEC-RAS program. ESRI's ArcMap program was used to review and refine cross section layout orientation.

First pass cross section layout was performed using an automated routine in WISE based on the drainage area at the cross section location. A first draft model was created based on this initial cross section layout and draft boundaries were developed. At this stage, a second pass inspection for cross section placement occurred. Significant refinement occurred during this step. To improve the hydraulic models, additional cross sections were added as needed to better define the BLE floodplain boundary. Cross sections were extended in locations where overtopping occurred. Orientation of cross sections was refined to improve on the perpendicular orientation to flow. Additional cross sections were added at floodplain constrictions and at downstream portions of tributaries to ensure a proper tie-in with receiving streams. Cross sections were adjusted to remove sections that intersected hydraulic crossings in the floodplain. For some of the largest studied streams, cross sections were laid out manually in order to have more reasonable spacing and better capture the constrictions in the floodplain.

Cross sections were not drawn on top of roadways or railroads. Cross sections were placed at the upstream and downstream face of major roads and railroads. Major roads are those designated in the Texas DOT road coverage as On System Highways. The road coverage can be acquired in shapefile format from the TNRIS website at the following link: <https://tnris.org/data-catalog/entry/txdot-roadways/>. Ineffective flow stations were placed in the hydraulic models as appropriate to account for flow constrictions at crossings as well as at locations deemed by the engineer to be ineffective at conveying flow downstream.

Cross sections were drawn on dam tops for significant dams with well defined spillways in order to better represent ponded water upstream of the structures. It was assumed in doing this that the vast majority of the flow during a flood event would pass the spillway and that the hydraulic model would reasonably estimate flow across the spillway as represented in the hydraulic cross section. This was the method used for the Chambers/Chambers Reservoir as flood elevations at the desired frequencies were not available. The elevations used in the modeling were checked against known elevations from past flooding events and effective Zone A boundaries and the results were determined reasonable.

Significant effort was made to start all tributaries below the receiving water surface elevations but this was not always achieved, particularly in wide, flat floodplains where small tributaries ran parallel to large streams or where road crossings or dams interfered with cross section alignments.

There are levees in this watershed along Chambers Creek both upstream and downstream of the confluence with Waxahachie Creek as well as levees on Waxahachie Creek. These levees are not certified under NFIP and the reaches with levees were modeled using the natural valley approach.



For the upper portion of Chambers Creek in Ellis County, not accounting for the levee may be a contributing factor to why a water surface elevation tie-in with the effective study could not be achieved at the upstream of the BLE model.

The relationship between drainage area and assigned channel geometry is shown in Table 3. These default values for dimensions and spacing are subject to change based on the details noted above as well as the judgment of the responsible engineer.

Table 3: Cross Section Default Parameters

Drainage area (upper limit)	XS Spacing	Channel Top Width	Channel Bottom Width	Channel Depth
1.0	500	4	3.5	0.5
2.0	500	6	5	0.5
4.0	500	11	10	0.5
8.0	500	18	17	0.5
10.0	500	20	19	0.5
15.0	600	26	25	0.5
20.0	600	32	31	0.5
25.0	600	38	36	0.5
30.0	600	43	41	0.5
40.0	600	52	50	0.5
50.0	600	60	57	1
75.0	750	68	65	1
100.0	750	76	73	1
150.0	1000	91	88	1
250.0	1000	122	119	2
500.0	1500	198	195	2
1000.0	2500	351	346	3
2000.0	4000	657	652	3
5000.0	4000	1575	1565	3
>5000.0	4000	2000	1990	4

Manning's roughness coefficients (n-values) were determined using the 2011 National Land Cover Data (NLCD) dataset in combination with n-values from Chow (1959) and Calenda, et al. (2005). The association between the n-values and the NLCD Classification is shown in Table 4. Manning's n-value takeoffs were performed by WISE and the n-values were adjusted in some locations based on engineering judgment. N-values within channel banks were limited by the automated routine to a range of 0.030 to 0.070.

Table 4: Manning's "n" Roughness Based on 2001 NLCD Classification (Moore, 2011)

NLCD Classification	Minimum	Normal	Maximum	Source
Open Water	.025	.03	.033	Chow 1959
Developed, Open Space	.01	.013	.016	Calenda, et al. 2005
Developed, Low Intensity	.038	.05	.063	Calenda, et al. 2005
Developed, Medium Intensity	.056	.075	.094	Calenda, et al. 2005
Developed, High Intensity	.075	.1	.125	Calenda, et al. 2005
Barren Land	.025	.03	.035	Chow 1959
Deciduous Forest	.1	.12	.16	Chow 1959

NLCD Classification	Minimum	Normal	Maximum	Source
Evergreen Forest	.1	.12	.16	Chow 1959
Mixed Forest	.1	.12	.16	Chow 1959
Scrub/Shrub	.035	.05	.07	Chow 1959
Grassland/Herbaceous	.025	.03	.035	Chow 1959
Pasture/Hay	.03	.04	.05	Chow 1959
Cultivated Crops	.025	.035	.045	Chow 1959
Woody Wetlands	.08	.1	.12	Chow 1959
Emergent Herbaceous Wetland	.075	.1	.15	Chow 1959

The boundary condition used for the majority of the study streams was normal depth with a default value of 0.005 ft/ft. For streams with names in the National Flood Hazard Layer (NFHL) and streams with large drainage areas (generally greater than 10 square miles), the normal depth slope was calculated based on the HEC-RAS profile invert. For studies that have a known downstream water surface elevation from an effective study, those known water elevations were used as the starting condition.

Stage data was available for the Navarro-Mills Dam from USGS Gage 0863050. A statistical analysis using a Log-Pearson III (LP3) distribution was performed to determine reasonable stage elevations for each of the modeled return periods.

1.4 Quality Control

Following the initial BLE analysis in each watershed, the flood hazard area delineations created by the BLE process were reviewed for areas where the results were not ideal.

QC results indicated that some of the models should be extended to cover the scope of effective flood hazard data. Those streams were extended farther upstream to match the extents of the SFHA data.

Typical manual editing resulting from reasonability checks included adding cross-sections, adjusting orientation of cross sections, trimming cross sections and reduction of the default “V” angle of cross sections. It is estimated that 50 percent of cross-sections were adjusted in some work areas while other areas did not require as much editing. Other examples of manual editing included adding cross-sections at confluence areas, modification to improve perpendicular orientation at the channel, adjustment of discharge breaks to better represent flow addition points, revisions to dam spillways and dam tops, and revisions to n-values.

A major component of the QC process was an automated check that identified locations where the 1-percent a.c.e profile was crossed by another frequency or by the 1-percent plus or 1-percent minus profile. Significant effort was made to reasonably resolve all of these instances. Another automated check identified locations where there was a drawdown of greater than 0.5 feet on the 1-percent a.c.e. water surface profile. This check is particularly useful for identifying errors in the model such as a channel that is too wide, a poorly placed cross section, or a need for additional cross sections. Again, significant effort was made to reasonably resolve these drawdown situations.

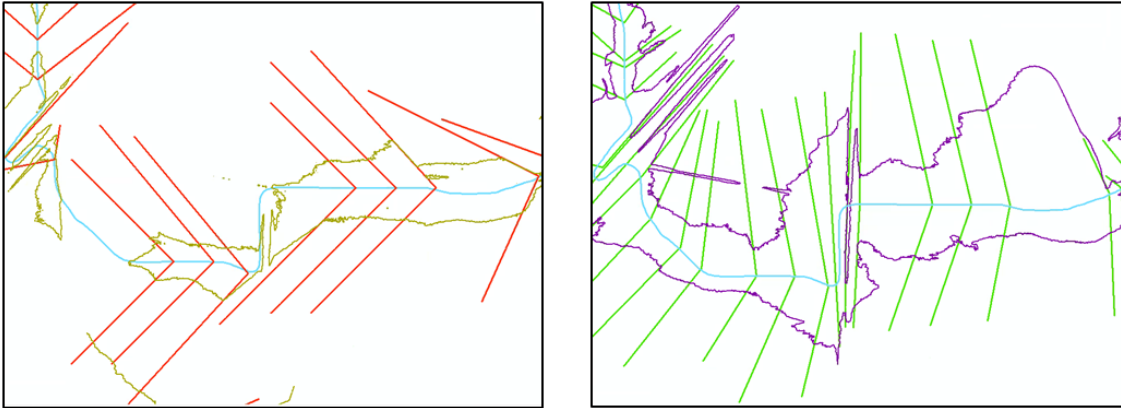


Figure 4: Default “V” angle cross-sections automated by WISE (left). Manually edited cross-sections to more accurately capture terrain (right). Resulting flood boundaries shown in gold (left) or purple (right) for clarity.

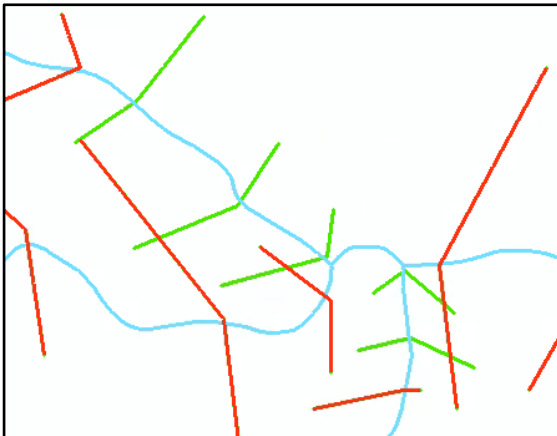


Figure 5: Manually added cross-sections (green) to improve accuracy of tie-ins at confluences.

1.5 One-percent Special Flood Hazard Area Delineation

The 1-percent and 0.2-percent boundaries were mapped using a routine that develops water surface elevation grids based on the 10-foot cell size DEM developed from the TNRIS LiDAR. This product was converted to a polygon for cleaning. The cleaning routine involved manual inspection of the polygons to identify and remove areas of disconnected flooding. In general, areas with a size of less than 5,000 square feet were removed and all others were investigated to determine whether they should be considered as potentially part of the special flood hazard area (SFHA). This investigation was aided by the ground DEM and aerial imagery. Manual adjustments to the polygons were made to account for spillways on dams which could not be accurately modeled using HEC-RAS as well as disconnected areas along the flooding source that should reasonably be connected.

Following the removal of disconnected flooding areas and other boundary adjustments, the small islands in the floodplain were filled. Islands with a size between roughly 5,000 and 30,000 square feet were inspected and, in general, islands that were less than 10,000 square feet were filled.

Once the island filling process was complete, the water surface raster mapping routine was run and set to conform to the polygon boundary. This ensures that the water surface raster and the



flood plain boundary are consistent with each other. The depth raster product was created at the end of the process by performing a raster subtraction with the water surface elevation raster and the ground DEM.

Challenges

Challenges encountered during BLE analyses will vary based on available data on which to run the analysis. The Chambers Watershed analysis presented challenges as summarized in the following paragraphs.

As noted in Section 1.2 above, there are a significant number of flood control dams on tributaries to Chambers Creek. Hydrologic results from regression calculations were not adjusted to take into account the impact of these structures. Further investigation should be conducted when upgrading these models.

As noted in Section 1.3 above, significant effort was made to start all tributaries below the receiving water surface elevations but this was not always achieved, particularly in wide, flat floodplains where small tributaries ran parallel to large streams or where road crossings or dams interfered with cross section alignments.

As noted in Section 1.4 above, multiple streamlines did not extend far enough to fully capture effective flood hazard data. The streamlines generated in the development of the one square mile basins were extended in order to more closely match the effective areas and CNMS streams.



Results and Recommendations

The BLE results for the Chambers Watershed produced an SFHA that compares reasonably well with the effective SFHA in most cases, and provides an additional estimated SFHA in areas that do not currently have an SFHA mapped. These results provide context for flood risk communication as part of the Discovery process, and should be verified through community work map meetings before being applied to a regulatory product.

A map showing the BLE results are included as Appendix B.

3.1 Validation of Effective Zone A SFHA

The full inventory of Zone A studies (1,177 miles) in the Chambers Watershed were classified in CNMS with a validation status of “UNKNOWN” and status type of “TO BE ASSESSED.” The following is a summary of the results of the CNMS validation assessment for the effective Zone A studies in the study area. Initial Assessment checks A1-A3 were evaluated for the CNMS inventory of Zone A studies.

INITIAL ASSESSMENT A1 – SIGNIFICANT TOPOGRAPHY UPDATE CHECK

This check involves determining whether a topographic data source is available that is significantly better than what was used for the effective Zone A modeling and mapping. For the study area in TX, the effective Zone A topographic data leveraged a variety of sources, but primarily based upon USGS 24K map products. The TNRIS 2013 1-meter gridded DEM data derived from Lidar within the study area represents a significant improvement from the assumed effective Zone A topographic source.

INITIAL ASSESSMENT A2 – CHECK FOR SIGNIFICANT HYDROLOGY CHANGES

This check involves first determining whether new regression equations have become available from the USGS since the date of the effective Zone A study. If newer regression equations exist for the area of interest, then an engineer must determine whether these regression equations would significantly affect the 1-percent-annual-chance flow. Scientific Investigations Report 2009-5087, Regression Equations for Estimation of Annual Peak-Streamflow Frequency for Undeveloped Watersheds in Texas Using an L-moment-Based, PRESS-Minimized, Residual-Adjusted Approach (2009) contains the most recent regression equations for Texas. The Regression Equations used for the effective Zone A studies for Ellis, Navarro and Hill Counties were developed using the USGS Water Resources Investigations Report 96-4307, “Regional Equations for Estimation of Peak-Streamflow Frequency for Natural Basins in Texas”. However, the equations used for the effective Zone A studies in Johnson County are unknown. The newer Regression Equations will not significantly impact the 1-percent annual chance flow and therefore A-2 was passed.

INITIAL ASSESSMENT A3 – CHECK FOR SIGNIFICANT DEVELOPMENT

This check involves using the National Urban Change Indicator (NUCI) dataset to assess increased urbanization in the watershed of the Zone A study. If the percentage of urban area within the HUC-12 watershed containing the effective Zone A study is 15% or more, and has increased by 50% or more since the effective analysis, the study would fail this check. Although the NUCI data provide year-to-year changes in urbanization, the NLCD also is needed to establish a baseline of



urban land cover for this analysis. The check for significant development in the TX study area was completed by evaluating percentage of urban change at the HUC-12 level. Of the 30 HUC-12 polygons within the study area, only one (120301090405, Elm Creek-Post Oak Creek) meets the threshold of 15% or more urban cover, however there is no increase in urbanization of 50% or more since the effective study.

Table 5: Zone A Initial Assessment Results

Assessment Check	Pass / Fail	Notes
A1 – Topography	Fail	TNRIS 2013 LiDAR significantly better than effective USGS topo source.
A2 – Hydrology	Pass	Latest regression equations for TX are dated 2009. Ellis, Navarro and Hill Counties used regression equations from 1997 while the source for Johnson County is unknown.
A3- Development	Pass	No increase of 50% or more since effective study

VALIDATION CHECK A4 – CHECK OF STUDIES BACKED BY TECHNICAL DATA

Zone A studies that pass all initial assessment checks described above may be categorized as “Valid” in the CNMS Inventory only if the effective Zone A study is supported by modeling or sound engineering judgment and all regulatory products are in agreement. If the effective Zone A study passes all initial assessment checks, but is not supported by modeling, or if the original engineering method used is unsupported or undocumented, a comparison of the BLE results and effective Zone A’s is performed. Due to lack of complete documentation of the original engineering methods in Johnson County, check A4 for streams within these counties have been marked as unknown in CNMS. Streams within Ellis, Navarro and Hill Counties have been marked as unverified in FEMA’s CNMS database since they were supported by sound engineering judgment.

VALIDATION CHECK A5 – COMPARISON OF BLE AND EFFECTIVE ZONE A

The BLE /effective Zone A comparison method leverages the existing Floodplain Boundary Standard (FBS) certification procedures described in FEMA SID 113, but with a slight modification. This modified FBS comparison approach uses the 1-percent plus and 1-percent minus flood profiles and horizontal and vertical tolerances described in the *First Order Approximation—Methodology, Validation, and Scalability Guidance Procedures (Version 1.5)*. For the comparison of BLE and effective Zone A in the Texas study area, the following vertical and horizontal tolerances were used to conduct the modified FBS procedure. One point was placed every 200 feet along the floodplain boundaries for comparison.

Vertical Tolerance: +/- 5 feet (one-half contour interval of assumed effective topographic source).

Horizontal Tolerance: +/-75 feet (standard horizontal tolerance for BLE comparison testing).

Of the 526 modeled BLE streams in the study area, 523 were found to correspond (within the tolerance limits) with effective Zone A flood zones. Comparison results for these streams were grouped at the HUC-12 level and are summarized in Table 7 below. Streams where the percentage of passing FBS sample points is greater than or equal to 85% are marked as “Pass”, otherwise marked as “Fail”. Of the 523 stream reaches evaluated, comprising 1,177 miles of the



CNMS Inventory of Zone A studies, only one of the HUC-12s (1120301090303), comprising 30.13 stream miles, passed the comparison check.

VALIDATION RESULTS

Based on the validation assessments and BLE comparison results described above, the CNMS inventory of Zone A studies in the Chambers Watershed study area has been updated, with 1,147.37 miles categorized as UNVERIFIED – TO BE STUDIED, and 30.13 miles categorized as VALID – NVUE COMPLIANT. Total miles in each of these categories are summarized in Table 6 and illustrated in Figure 3 below.

Table 6: Zone A Validation Results

Validation Status	Status Type	Total Miles
VALID	NVUE COMPLIANT	30.13
UNVERIFIED	TO BE STUDIED	1,147.37

Table 7: BLE Comparison Results

HUC-12 Watershed		Total FBS points	Fail	Pass	%Pass	BLE Comparison Pass? (>85%)	Priority Score
Watershed Name	Watershed Number						
Chambers	All Streams	50,178	37,055	13,123	73.8%	Fail	
Headwaters North Fork Chambers Creek	120301090101	3,482	2,776	706	79.70%	Fail	15.1
Upper North Fork Chambers Creek	120301090102	1,595	1,216	379	76.20%	Fail	19.1
Armstrong Creek - Cottonwood Creek	120301090103	2,007	1,574	433	78.40%	Fail	17.3
Middle North Fork Chambers Creek	120301090104	547	412	135	75.30%	Fail	19.9
Lower North Fork Chambers Creek	120301090105	615	433	182	70.40%	Fail	24.0
Upper South Fork Chambers Creek	120301090106	2,703	2,198	505	81.30%	Fail	12.0
Island Creek	120301090107	5,780	4,372	1,408	75.60%	Fail	12.4
Lower South Fork Chambers Creek	120301090108	1,694	1,393	301	82.20%	Fail	13.0
Greathouse Branch - Chambers Creek	120301090201	634	473	161	74.60%	Fail	20.3
Baker Branch – Chambers Creek	120301090202	1,152	853	299	74.00%	Fail	20.9
Houston Creek – Chambers Creek	120301090203	1,763	1,251	512	71.00%	Fail	25.1
Upper Mill Creek	120301090204	1,757	1,285	472	73.10%	Fail	20.5
Middle Mill Creek	120301090205	1,564	1,005	559	64.30%	Fail	28.1
Lower Mill Creek	120301090206	1,914	1,404	510	73.40%	Fail	12.3
Cryer Creek –	120301090207	804	607	197	75.50%	Fail	15.4

HUC-12 Watershed		Total FBS points	Fail	Pass	%Pass	BLE Comparison Pass? (>85%)	Priority Score
Watershed Name	Watershed Number						
Chambers Creek							
Headwaters Waxahachie Creek	120301090301	1,635	1,241	394	75.90%	Fail	17.8
Upper Waxahachie Creek	120301090302	787	623	164	79.20%	Fail	14.7
South Prong Creek – Lake Waxahachie	120301090303	1,312	1,173	139	89.40%	Pass	8.2
Middle Waxahachie Creek	120301090304	895	647	248	72.30%	Fail	22.2
Mustang Creek – Bardwell Lake	120301090305	1,496	1,101	395	73.60%	Fail	21.8
Lower Waxahachie Creek	120301090306	1,476	821	655	55.60%	Fail	35.9
Upper Big Onion Creek	120301090307	1,687	1,217	470	72.10%	Fail	23.0
Lower Big Onion Creek	120301090308	1,898	1,395	503	73.50%	Fail	22.4
Cummins Creek	120301090401	2,564	1,801	763	70.20%	Fail	20.1
Oak Branch – Chambers Creek	120301090402	1,100	698	402	63.50%	Fail	26.2
Tupelo Branch – Chambers Creek	120301090403	1,838	1,330	508	72.40%	Fail	15.0
Briar Creek	120301090404	2,275	1,459	816	64.10%	Fail	22.4
Elm Creek – Post Oak Creek	120301090405	1,979	1,391	588	70.30%	Fail	23.0
Cedar Creek – Chambers Creek	120301090406	1,029	802	227	77.90%	Fail	14.9
Long Arm Branch – Chambers Creek	120301090407	196	104	92	53.1%	Fail	31.3

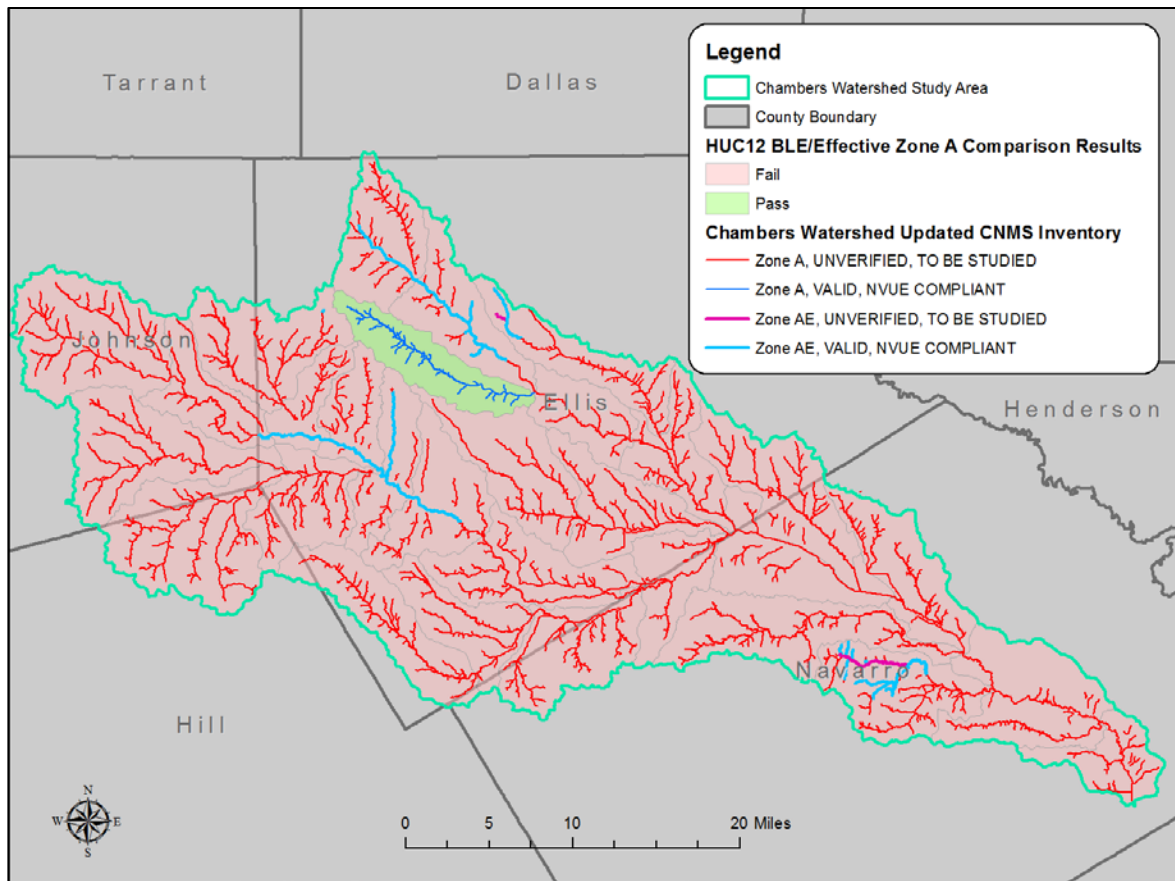


Figure 6. Chambers Watershed CNMS Validation Results

An overall risk for each HUC-12 watershed was calculated using the National Flood Risk Percentages Dataset and its proportional area. The weighted risk was multiplied by the percentage of points in the watershed that failed the CNMS comparison to effective to determine the priority score. The range of the Richland HUC-8 priority scores can be used to initiate discussions during the Discovery phase. Lower Waxahachie Creek HUC-12 was determined to have the highest priority score and the most need while South Prong Creek – Lake Waxahachie HUC-12 has the lowest score.



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Appendix A Summary of Peak Qs

Table A-1. Summary of Hydrology

Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Armstrong Creek	1.08	2,375	1,191	4,740
Armstrong Creek	1.21	2,536	1,271	5,060
Armstrong Creek	1.48	2,849	1,428	5,685
Armstrong Creek	2.07	3,532	1,770	7,047
Armstrong Creek	3.11	4,699	2,355	9,375
Armstrong Creek	3.27	4,557	2,284	9,093
Armstrong Creek	3.34	4,511	2,261	9,001
Armstrong Creek	6.11	7,018	3,517	14,002
Armstrong Creek	6.75	7,260	3,638	14,485
Armstrong Creek	8.77	8,758	4,389	17,474
Armstrong Creek	14.38	12,175	6,102	24,293
Armstrong Creek	23.58	17,189	8,615	34,296
Baker Branch	2.09	2,610	1,308	5,208
Baker Branch	2.76	3,189	1,599	6,364
Baker Branch	5.04	5,187	2,600	10,349
Baker Branch	5.91	5,486	2,750	10,947
Baker Branch	6.68	5,937	2,976	11,846
Bee Creek	0.83	1,483	743	2,959
Bee Creek	1.63	2,589	1,298	5,166
Bee Creek	1.74	2,766	1,386	5,519
Bee Creek	2.08	3,138	1,573	6,261
Bee Creek	2.52	3,523	1,766	7,030
Bee Creek	3.47	4,594	2,302	9,166
Bee Creek	3.79	4,713	2,362	9,403
Bee Creek	4.25	5,187	2,600	10,350
Bee Creek	5.49	6,173	3,094	12,317
Bell Branch	1.32	2,126	1,066	4,242
Bell Branch	1.64	2,370	1,188	4,728
Bell Branch	2.63	3,551	1,780	7,086
Bell Branch	2.79	3,644	1,826	7,271
Bell Branch	3.29	4,156	2,083	8,292
Bell Branch	4.22	4,759	2,385	9,495
Bell Branch	4.35	4,947	2,479	9,870
Bell Branch	5.11	5,471	2,742	10,915
Bell Branch	5.39	5,604	2,809	11,182



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Bell Branch	6.10	6,161	3,088	12,293
Bell Branch	6.20	6,300	3,158	12,570
Big Onion Creek	1.74	1,954	979	3,899
Big Onion Creek	3.96	3,718	1,863	7,419
Big Onion Creek	5.65	4,709	2,360	9,396
Big Onion Creek	6.17	5,025	2,519	10,027
Big Onion Creek	7.13	5,507	2,760	10,988
Big Onion Creek	8.69	6,288	3,151	12,546
Big Onion Creek	9.16	6,436	3,226	12,842
Big Onion Creek	9.71	6,712	3,364	13,391
Big Onion Creek	12.46	8,190	4,105	16,341
Big Onion Creek	12.75	8,326	4,173	16,613
Big Onion Creek	13.57	8,687	4,354	17,332
Big Onion Creek	13.92	8,803	4,412	17,563
Big Onion Creek	14.31	8,923	4,472	17,804
Big Onion Creek	15.99	9,748	4,886	19,450
Big Onion Creek	17.32	10,231	5,128	20,414
Big Onion Creek	18.54	10,665	5,345	21,280
Big Onion Creek	20.29	11,573	5,800	23,091
Big Onion Creek	20.69	11,501	5,764	22,948
Big Onion Creek	40.18	19,066	9,556	38,042
Big Onion Creek	41.17	19,385	9,715	38,678
Big Onion Creek	42.89	19,755	9,901	39,416
Big Onion Creek	45.21	19,844	9,945	39,593
Big Onion Creek	46.40	20,223	10,135	40,350
Big Onion Creek	55.41	23,186	11,621	46,263
Big Onion Creek	59.86	23,856	11,956	47,599
Big Onion Creek	63.52	24,734	12,396	49,351
Big Onion Creek	67.44	25,815	12,938	51,509
Big Onion Creek	70.28	26,191	13,127	52,259
Big Onion Creek	72.06	26,044	13,053	51,965
Big Onion Creek	75.12	26,246	13,154	52,367
Boggy Branch	1.24	1,476	740	2,945
Boggy Branch	1.75	1,935	970	3,860
Boggy Branch	2.55	2,599	1,303	5,186
Boggy Branch	2.93	2,847	1,427	5,680
Boggy Branch	3.55	3,244	1,626	6,473
Boggy Branch	3.78	3,340	1,674	6,665



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Boggy Branch	4.10	3,436	1,722	6,855
Boggy Branch	4.91	3,762	1,885	7,505
Boggy Branch	6.88	4,997	2,504	9,969
Boggy Branch	7.88	5,482	2,747	10,937
Boggy Branch	8.80	5,932	2,973	11,836
Boggy Creek	1.04	1,278	640	2,549
Boggy Creek	1.39	1,584	794	3,160
Boggy Creek	1.68	1,792	898	3,575
Boggy Creek	2.03	2,047	1,026	4,084
Boggy Creek	2.42	2,276	1,141	4,541
Boggy Creek	2.75	2,483	1,245	4,955
Boggy Creek	3.03	2,646	1,326	5,280
Boggy Creek	3.59	2,944	1,476	5,875
Boggy Creek	3.99	3,174	1,591	6,333
Boggy Creek	4.55	3,528	1,768	7,039
Boggy Creek	4.99	3,768	1,888	7,518
Boggy Creek	5.87	4,299	2,155	8,579
Boggy Creek	7.16	5,001	2,507	9,979
Clear Creek	1.45	1,127	565	2,249
Clear Creek	3.87	2,655	1,331	5,297
Clear Creek	4.82	3,301	1,654	6,585
Clear Creek	5.59	3,627	1,818	7,237
Clear Creek	8.61	5,366	2,690	10,707
Cottonwood Creek	1.60	1,792	898	3,577
Cottonwood Creek	3.26	2,953	1,480	5,892
Cottonwood Creek	3.51	3,027	1,517	6,039
Cottonwood Creek	4.30	3,519	1,764	7,022
Cottonwood Creek	5.16	4,089	2,050	8,159
Cottonwood Creek	6.18	4,513	2,262	9,004
Cottonwood Creek	6.56	4,500	2,255	8,978
Cottonwood Creek	8.95	5,647	2,830	11,267
Cottonwood Creek	12.10	7,089	3,553	14,144
Cottonwood Creek	13.49	7,558	3,788	15,080
Cottonwood Creek	15.46	8,201	4,110	16,364
Cottonwood Creek	17.51	8,659	4,340	17,277
Cottonwood Creek	43.82	17,132	8,586	34,183
Cottonwood Creek	55.25	20,241	10,144	40,386
E Fork Chambers Creek	1.00	1,770	887	3,531



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
E Fork Chambers Creek	2.61	4,282	2,146	8,544
E Fork Chambers Creek	3.58	5,140	2,576	10,255
E Fork Chambers Creek	4.57	6,454	3,235	12,878
E Fork Chambers Creek	5.38	7,069	3,543	14,105
E Fork Chambers Creek	6.38	7,537	3,777	15,038
E Fork Chambers Creek	7.40	8,142	4,081	16,245
E Fork Chambers Creek	9.11	9,478	4,750	18,911
E Fork Chambers Creek	10.23	10,339	5,182	20,630
E Fork Weakly Branch	1.36	1,952	978	3,895
E Fork Weakly Branch	1.65	2,251	1,128	4,491
E Fork Weakly Branch	1.91	2,477	1,242	4,943
E Fork Weakly Branch	2.29	2,843	1,425	5,673
E Fork Weakly Branch	2.95	3,570	1,789	7,123
E Fork Weakly Branch	2.99	3,237	1,622	6,458
Elm Branch	0.58	750	376	1,496
Elm Branch	1.07	1,149	576	2,292
Elm Branch	1.68	1,622	813	3,237
Elm Branch	2.27	2,040	1,023	4,071
Elm Branch	3.06	2,517	1,261	5,022
Elm Branch	3.91	2,956	1,481	5,897
Elm Branch	8.44	5,734	2,874	11,440
Elm Branch	9.41	5,965	2,990	11,902
Elm Branch	10.34	5,969	2,992	11,910
Elm Branch	10.61	6,028	3,021	12,027
Flat Rock Branch	1.00	1,266	634	2,526
Flat Rock Branch	1.94	2,157	1,081	4,304
Flat Rock Branch	2.25	2,429	1,218	4,847
Flat Rock Branch	5.32	4,918	2,465	9,813
Flat Rock Branch	6.32	5,404	2,708	10,783
Flat Rock Branch	7.28	5,655	2,834	11,284
Flat Rock Branch	7.76	5,711	2,862	11,394
Flat Rock Branch	8.28	5,970	2,992	11,912
Flat Rock Branch	8.43	6,030	3,022	12,032
Greathouse Branch	0.82	1,235	619	2,463
Greathouse Branch	2.18	2,853	1,430	5,693
Greathouse Branch	2.52	3,190	1,599	6,366
Greathouse Branch	3.51	4,096	2,053	8,172
Greathouse Branch	4.39	4,754	2,383	9,485



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Greathouse Branch	4.97	5,105	2,558	10,185
Greathouse Branch	5.96	5,880	2,947	11,732
Greathouse Branch	6.78	6,447	3,231	12,864
Greathouse Branch	7.72	6,896	3,456	13,759
Greathouse Branch	8.20	7,103	3,560	14,172
Hayden Creek	1.00	1,726	865	3,443
Hayden Creek	1.18	1,890	947	3,770
Hayden Creek	2.10	2,991	1,499	5,967
Hayden Creek	2.38	3,271	1,639	6,526
Hayden Creek	2.78	3,547	1,778	7,077
Hayden Creek	3.19	3,696	1,852	7,374
Hog Creek	0.84	1,192	597	2,378
Hog Creek	1.96	2,452	1,229	4,891
Hog Creek	2.40	2,715	1,361	5,418
Hog Creek	4.06	4,181	2,095	8,341
Hog Creek	6.00	5,505	2,759	10,984
Hog Creek	7.00	5,977	2,996	11,927
Hog Creek	8.00	6,266	3,140	12,502
Hog Creek	8.90	6,580	3,298	13,130
Hog Creek	9.71	6,792	3,404	13,552
Hog Creek	10.38	7,095	3,556	14,157
Houston Creek	1.06	1,310	657	2,614
Houston Creek	1.97	2,142	1,073	4,274
Houston Creek	2.40	2,588	1,297	5,163
Houston Creek	3.40	3,481	1,745	6,946
Houston Creek	4.65	4,335	2,173	8,649
Houston Creek	6.72	5,640	2,827	11,253
Island Creek	1.12	1,680	842	3,352
Island Creek	1.35	1,798	901	3,588
Island Creek	3.36	3,990	2,000	7,960
Island Creek	4.51	4,967	2,490	9,911
Island Creek	5.15	5,170	2,591	10,316
Island Creek	5.89	5,675	2,844	11,324
Island Creek	7.17	6,590	3,303	13,150
Island Creek	7.24	6,537	3,276	13,043
Island Creek	7.50	6,679	3,347	13,326
Island Creek	16.26	13,407	6,719	26,750
Island Creek	16.43	13,357	6,695	26,652



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Island Creek	19.77	14,288	7,161	28,507
Island Creek	22.96	15,598	7,818	31,123
Island Creek	24.23	16,272	8,155	32,467
Island Creek	25.10	16,346	8,192	32,614
Island Creek	25.55	16,471	8,255	32,863
Island Creek	25.92	16,514	8,277	32,950
Island Creek	27.28	16,725	8,382	33,371
Island Creek	38.97	20,992	10,521	41,885
Island Creek	56.99	27,172	13,618	54,215
Island Creek	60.14	27,110	13,587	54,092
LC_Briar Creek	1.05	1,409	706	2,812
LC_Briar Creek	2.04	2,070	1,038	4,131
LC_Briar Creek	5.20	4,098	2,054	8,177
LC_Briar Creek	6.16	4,552	2,281	9,082
LC_Briar Creek	7.16	4,795	2,403	9,567
LC_Briar Creek	7.51	4,904	2,458	9,785
LC_Briar Creek	18.51	9,948	4,986	19,848
LC_Briar Creek	19.37	10,257	5,141	20,465
LC_Briar Creek	22.17	11,147	5,587	22,242
LC_Briar Creek	22.40	11,163	5,595	22,273
LC_Briar Creek	23.05	11,393	5,710	22,733
LC_Briar Creek	23.22	11,402	5,714	22,750
LC_Briar Creek	24.21	11,712	5,870	23,369
LC_Briar Creek	25.08	11,826	5,927	23,597
LC_Briar Creek	25.98	12,028	6,029	24,000
LC_Briar Creek	28.01	12,654	6,342	25,249
LC_Briar Creek	32.45	13,830	6,932	27,595
LC_Briar Creek	33.92	14,270	7,152	28,472
LC_Briar Creek	34.63	14,404	7,219	28,739
LC_Briar Creek	35.55	14,581	7,308	29,093
LC_Briar Creek	36.22	14,576	7,305	29,083
LC_Briar Creek	37.39	14,641	7,338	29,212
LC_Briar Creek	38.86	14,998	7,517	29,924
LC_Briar Creek	39.67	15,068	7,552	30,064
LC_Briar Creek	40.30	15,085	7,560	30,098
LC_Briar Creek	42.96	15,395	7,716	30,718
LC_Briar Creek	43.41	15,327	7,682	30,582
LC_Briar Creek	44.33	15,321	7,679	30,570



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Briar Creek	44.79	15,166	7,601	30,261
LC_Briar Creek	47.47	15,762	7,900	31,448
LC_Briar Creek	48.46	15,856	7,947	31,638
LC_Briar Creek	49.46	16,091	8,065	32,106
LC_Briar Creek	54.44	16,570	8,305	33,062
LC_Bryant Branch	0.43	790	396	1,576
LC_Bryant Branch	0.92	1,362	683	2,717
LC_Burke Branch	1.24	1,421	712	2,835
LC_Cedar Creek	1.16	1,230	617	2,455
LC_Cedar Creek	1.80	1,670	837	3,332
LC_Cedar Creek	2.78	2,353	1,179	4,695
LC_Cedar Creek	3.31	2,641	1,324	5,270
LC_Cedar Creek	3.77	2,845	1,426	5,677
LC_Cedar Creek	4.69	3,243	1,625	6,470
LC_Cedar Creek	5.69	3,700	1,854	7,382
LC_Cedar Creek	6.21	3,880	1,945	7,742
LC_Cedar Creek	6.66	4,105	2,057	8,191
LC_Cedar Creek	7.56	4,465	2,238	8,909
LC_Cedar Creek	8.51	4,807	2,409	9,591
LC_Cedar Creek	8.82	4,931	2,471	9,838
LC_Cedar Creek	9.51	5,120	2,566	10,216
LC_Cedar Creek	10.39	5,394	2,703	10,762
LC_Cedar Creek	11.26	5,539	2,776	11,052
LC_Cedar Creek	12.25	5,703	2,858	11,379
LC_Cedar Creek	13.01	5,766	2,890	11,505
LC_Cedar Creek	15.62	6,377	3,196	12,725
LC_Cummins Creek	1.18	1,265	634	2,524
LC_Cummins Creek	2.12	1,926	965	3,843
LC_Cummins Creek	3.00	2,314	1,160	4,618
LC_Cummins Creek	5.37	3,724	1,866	7,430
LC_Cummins Creek	8.71	5,167	2,590	10,309
LC_Cummins Creek	9.52	5,307	2,660	10,588
LC_Cummins Creek	10.44	5,684	2,849	11,340
LC_Cummins Creek	10.73	5,780	2,897	11,533
LC_Cummins Creek	14.91	7,281	3,649	14,527
LC_Cummins Creek	15.11	7,348	3,683	14,662
LC_Cummins Creek	16.07	7,820	3,919	15,604
LC_Cummins Creek	19.24	8,700	4,360	17,358

Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Cummins Creek	20.00	8,872	4,446	17,701
LC_Cummins Creek	27.17	11,136	5,581	22,219
LC_Cummins Creek	30.58	11,905	5,967	23,753
LC_Cummins Creek	31.30	11,958	5,993	23,860
LC_Cummins Creek	31.81	11,997	6,013	23,937
LC_Cummins Creek	33.52	12,247	6,138	24,437
LC_Cummins Creek	34.59	12,164	6,097	24,271
LC_Cummins Creek	36.23	12,702	6,366	25,343
LC_Cummins Creek	39.65	13,422	6,727	26,781
LC_Elm Creek	0.37	576	289	1,150
LC_Elm Creek	0.56	837	420	1,670
LC_Elm Creek	0.93	1,273	638	2,540
LC_Elm Creek	1.14	1,479	741	2,951
LC_Elm Creek	1.55	1,864	934	3,719
LC_Elm Creek	1.99	2,222	1,113	4,433
LC_Elm Creek	2.67	2,701	1,354	5,390
LC_Elm Creek	3.60	3,419	1,714	6,823
LC_Elm Creek	4.32	3,727	1,868	7,437
LC_Elm Creek	5.30	4,330	2,170	8,639
LC_Elm Creek	5.40	4,358	2,184	8,696
LC_Elm Creek	7.22	5,509	2,761	10,993
LC_Elm Creek	9.32	6,485	3,250	12,940
LC_Elm Creek	11.66	7,467	3,742	14,899
LC_Elm Creek	12.30	8,100	4,060	16,162
LC_Jameson Creek	1.00	1,453	728	2,899
LC_Jameson Creek	1.92	2,244	1,124	4,476
LC_Little Cedar Creek	1.57	1,352	678	2,698
LC_Little Cedar Creek	2.54	2,014	1,009	4,018
LC_Little Cedar Creek	3.16	2,450	1,228	4,889
LC_Little Cedar Creek	3.43	2,564	1,285	5,116
LC_Little Cedar Creek	4.34	2,886	1,447	5,759
LC_Little Cedar Creek	5.32	3,208	1,608	6,400
LC_Little Cedar Creek	5.35	3,211	1,609	6,406
LC_Lockheart Branch	0.38	603	302	1,203
LC_Lockheart Branch	1.08	1,428	716	2,850
LC_Lockheart Branch	1.32	1,669	837	3,331
LC_Lockheart Branch	1.51	1,781	893	3,553
LC_Lockheart Branch	3.61	3,427	1,718	6,839



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Lockheart Branch	4.14	3,500	1,754	6,983
LC_Long Arm Branch	1.68	1,583	793	3,158
LC_Long Arm Branch	2.55	2,755	1,381	5,497
LC_Long Arm Branch	3.50	3,324	1,666	6,633
LC_Long Arm Branch	4.33	3,695	1,852	7,373
LC_Mesquite Branch	0.49	816	409	1,627
LC_Mesquite Branch	1.00	1,447	725	2,886
LC_Mesquite Branch	1.02	1,444	724	2,881
LC_Oak Branch	1.00	1,044	523	2,082
LC_Oak Branch	1.64	1,767	886	3,527
LC_Oak Branch	2.64	2,638	1,322	5,263
LC_Oak Branch	3.43	3,319	1,664	6,623
LC_Pecan Branch	1.70	1,903	954	3,796
LC_Post Oak Creek	2.13	2,150	1,077	4,289
LC_Post Oak Creek	7.11	5,238	2,625	10,452
LC_Post Oak Creek	8.58	5,905	2,959	11,782
LC_Post Oak Creek	9.50	6,287	3,151	12,545
LC_Post Oak Creek	10.88	6,568	3,292	13,106
LC_Post Oak Creek	18.79	9,467	4,745	18,889
LC_Post Oak Creek	20.20	9,908	4,966	19,769
LC_Post Oak Creek	33.20	14,639	7,337	29,209
LC_Post Oak Creek	34.21	14,554	7,294	29,038
LC_Post Oak Creek	34.59	14,486	7,260	28,904
LC_Post Oak Creek	34.76	14,468	7,251	28,867
LC_Post Oak Creek	36.21	14,625	7,330	29,180
LC_Post Oak Creek	39.68	14,977	7,506	29,883
LC_Post Oak Creek	40.37	14,902	7,469	29,734
LC_Post Oak Creek	41.44	14,854	7,445	29,638
LC_Post Oak Creek Tributary 1	0.20	375	188	749
LC_Post Oak Creek Tributary 2	0.20	411	206	820
LC_Post Oak Creek Tributary 4	0.35	677	339	1,351
LC_Post Oak Creek US	1.08	1,320	661	2,633
LC_Post Oak Creek US	1.11	1,318	660	2,629
LC_Post Oak Creek US	1.76	1,837	921	3,666
LC_Rice Branch	1.29	1,482	743	2,958
LC_Rice Branch	1.49	1,552	778	3,097
LC_Rice Branch	1.82	1,851	928	3,694
LC_Rice Branch	2.29	2,230	1,118	4,450



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Rice Branch	2.39	2,240	1,123	4,470
LC_Rice Branch	2.50	2,299	1,152	4,587
LC_Rice Branch	3.17	2,804	1,405	5,595
LC_Rice Branch	3.72	3,105	1,556	6,195
LC_Rice Branch	4.16	3,312	1,660	6,608
LC_Rice Branch	4.64	3,497	1,753	6,978
LC_Rice Branch	5.15	3,836	1,923	7,654
LC_Rice Branch	5.69	3,973	1,991	7,927
LC_Rice Branch	10.02	6,049	3,032	12,069
LC_Rice Branch	11.99	6,826	3,421	13,620
LC_Rice Branch	12.98	6,822	3,419	13,611
LC_Rice Branch	13.33	7,048	3,532	14,062
LC_Spring Branch	0.85	1,053	528	2,101
LC_Stream002	1.70	1,913	959	3,818
LC_Stream002	2.55	2,523	1,265	5,034
LC_Stream002	3.25	2,933	1,470	5,852
LC_Stream003	1.53	1,479	741	2,951
LC_Stream003	1.64	1,577	790	3,146
LC_Stream003	3.58	1,167	585	2,329
LC_Stream003	4.11	2,917	1,462	5,820
LC_Stream003	6.76	4,567	2,289	9,112
LC_Stream003	8.40	4,943	2,477	9,863
LC_Stream004	0.97	2,820	1,413	5,626
LC_Stream005	1.24	1,392	698	2,777
LC_Stream005	2.20	2,241	1,123	4,472
LC_Stream005	2.64	2,391	1,198	4,770
LC_Stream006	1.27	1,585	794	3,163
LC_Stream006	1.39	1,632	818	3,256
LC_Stream006	1.93	2,054	1,030	4,099
LC_Stream006	2.92	2,772	1,389	5,530
LC_Stream006	3.81	3,029	1,518	6,043
LC_Stream006	4.45	3,346	1,677	6,676
LC_Stream007	0.42	722	362	1,441
LC_Stream008	0.21	403	202	804
LC_Stream008	0.49	825	413	1,645
LC_Stream009	0.18	406	204	811
LC_Stream011	1.09	938	470	1,872
LC_Stream011	2.09	1,617	811	3,227



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Stream011	2.12	1,627	816	3,247
LC_Stream012	2.06	1,585	795	3,163
LC_Stream012	2.49	1,798	901	3,587
LC_Stream013	1.19	991	497	1,978
LC_Stream013	1.41	1,167	585	2,329
LC_Stream013	2.10	1,607	805	3,206
LC_Stream013	3.09	2,224	1,114	4,437
LC_Stream013	3.45	2,438	1,222	4,865
LC_Stream014	0.24	390	195	777
LC_Stream015	0.14	218	109	435
LC_Stream015	0.20	346	174	691
LC_Stream016	0.05	90	45	179
LC_Stream017	0.53	723	363	1,443
LC_Stream018	1.00	969	486	1,934
LC_Stream018	2.00	1,701	852	3,394
LC_Stream018	2.28	1,910	957	3,811
LC_Stream019	1.00	1,125	564	2,245
LC_Stream019	1.24	1,280	642	2,554
LC_Stream019	1.98	1,854	929	3,699
LC_Stream019	2.20	1,977	991	3,945
LC_Stream019	2.99	2,494	1,250	4,976
LC_Stream019	5.64	4,097	2,053	8,174
LC_Stream019	6.09	4,254	2,132	8,488
LC_Stream019	6.52	4,419	2,215	8,818
LC_Stream019	6.98	4,628	2,320	9,234
LC_Stream020	0.51	656	329	1,309
LC_Stream021	0.73	913	458	1,822
LC_Stream022	1.07	1,240	621	2,474
LC_Stream022	1.69	1,650	827	3,293
LC_Stream023	0.11	253	127	505
LC_Stream024	1.00	1,124	563	2,243
LC_Stream024	1.39	1,393	698	2,779
LC_Stream024	1.93	1,881	943	3,754
LC_Stream024	2.32	2,168	1,086	4,325
LC_Stream024	2.80	2,510	1,258	5,009
LC_Stream025	0.27	476	239	951
LC_Stream026	0.27	464	232	925
LC_Stream027	0.38	628	315	1,254



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Stream028	0.96	864	433	1,723
LC_Stream030	1.02	1,155	579	2,304
LC_Stream030	1.33	1,437	720	2,866
LC_Stream030	3.20	2,838	1,422	5,663
LC_Stream030	5.23	3,653	1,831	7,289
LC_Stream030	5.81	3,499	1,754	6,982
LC_Stream030	12.82	6,304	3,160	12,578
LC_Stream030	13.39	6,542	3,279	13,053
LC_Stream031	1.05	1,373	688	2,739
LC_Stream031	1.12	1,401	702	2,794
LC_Stream033	0.32	501	251	1,000
LC_Stream034	0.46	652	327	1,301
LC_Stream035	0.09	178	89	355
LC_Stream036	0.59	825	413	1,645
LC_Stream037	0.34	522	261	1,041
LC_Stream038	0.35	575	288	1,147
LC_Stream039	0.38	616	309	1,228
LC_Stream040	0.10	187	94	374
LC_Stream042	0.65	930	466	1,855
LC_Stream043	0.10	202	101	402
LC_Stream044	0.06	146	73	292
LC_Stream045	1.00	1,281	642	2,556
LC_Stream045	1.10	1,350	677	2,694
LC_Stream048	0.72	848	425	1,691
LC_Stream050	0.15	287	144	572
LC_Stream051	0.36	572	287	1,141
LC_Stream054	0.35	600	301	1,197
LC_Stream054	1.12	1,601	802	3,195
LC_Stream054	1.22	1,594	799	3,180
LC_Stream054	2.15	2,655	1,331	5,298
LC_Stream055	0.17	326	163	650
LC_Stream057	0.16	369	185	737
LC_Stream059	1.50	1,710	857	3,411
LC_Stream059	2.05	2,094	1,050	4,178
LC_Stream059	2.35	2,309	1,157	4,607
LC_Stream059	3.79	3,366	1,687	6,715
LC_Stream059	4.79	4,000	2,005	7,981
LC_Stream059	5.36	4,210	2,110	8,400



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Stream059	6.34	4,791	2,401	9,559
LC_Stream059	7.02	4,936	2,474	9,850
LC_Stream059	7.90	5,382	2,697	10,738
LC_Stream059	8.42	5,533	2,773	11,041
LC_Stream059	8.84	5,673	2,843	11,319
LC_Stream059	9.39	5,811	2,913	11,595
LC_Stream059	10.45	6,488	3,252	12,946
LC_Stream059	10.87	6,614	3,315	13,196
LC_Stream060	0.26	392	197	782
LC_Stream061	1.01	1,328	666	2,650
LC_Stream061	1.16	1,417	710	2,827
LC_Stream062	0.91	1,087	545	2,169
LC_Stream063	0.93	1,070	536	2,136
LC_Stream064	0.63	765	383	1,525
LC_Stream065	0.37	508	255	1,014
LC_Stream066	0.23	398	200	794
LC_Stream066	0.59	744	373	1,484
LC_Stream066	1.05	1,303	653	2,599
LC_Stream067	0.22	304	152	607
LC_Stream068	0.45	630	316	1,257
LC_Stream069	0.21	347	174	693
LC_Stream070	2.08	2,018	1,011	4,026
LC_Stream070	2.20	2,028	1,017	4,047
LC_Stream072	0.83	944	473	1,884
LC_Stream073	0.67	772	387	1,539
LC_Stream073	1.82	1,645	824	3,281
LC_Stream074	0.66	727	364	1,450
LC_Stream075	0.60	904	453	1,804
LC_Stream076	0.64	844	423	1,685
LC_Stream077	0.68	848	425	1,692
LC_Stream078	0.76	1,097	550	2,189
LC_Stream079	1.99	1,780	892	3,552
LC_Stream080	1.00	1,209	606	2,413
LC_Stream080	1.11	1,273	638	2,540
LC_Stream080	1.77	1,883	944	3,757
LC_Stream080	2.77	2,523	1,265	5,034
LC_Stream080	3.49	2,933	1,470	5,851
LC_Stream081	0.53	668	335	1,333



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Stream082	0.52	635	318	1,267
LC_Stream083	1.27	1,363	683	2,719
LC_Stream083	1.46	1,535	769	3,063
LC_Stream084	0.65	907	455	1,810
LC_Stream085	0.38	549	275	1,096
LC_Stream085	0.61	868	435	1,732
LC_Stream086	0.19	356	178	710
LC_Stream087	1.29	1,684	844	3,360
LC_Stream087	1.41	1,819	912	3,629
LC_Stream088	0.60	660	331	1,317
LC_Stream089	1.00	1,574	789	3,140
LC_Stream089	1.71	2,421	1,214	4,831
LC_Stream090	0.56	967	485	1,929
LC_Stream090	1.01	1,501	752	2,994
LC_Stream090	1.13	1,586	795	3,164
LC_Stream090	1.99	2,560	1,283	5,109
LC_Stream090	2.32	2,800	1,403	5,587
LC_Stream091	0.11	247	124	492
LC_Stream092	0.81	1,150	576	2,294
LC_Stream093	0.82	1,223	613	2,440
LC_Stream095	0.89	1,169	586	2,332
LC_Stream097	0.18	342	171	682
LC_Stream098	0.17	292	146	582
LC_Stream099	0.17	324	163	647
LC_Stream100	0.13	267	134	533
LC_Stream101	0.13	225	113	449
LC_Stream102	0.35	612	307	1,222
LC_Stream103	0.75	1,024	513	2,043
LC_Stream104	0.25	500	251	998
LC_Stream105	0.43	736	369	1,468
LC_Stream105	0.75	1,196	599	2,386
LC_Stream106	0.31	657	329	1,311
LC_Stream107	0.40	597	299	1,190
LC_Stream107	0.99	1,233	618	2,461
LC_Stream107	1.16	1,435	719	2,863
LC_Stream107	1.41	1,591	797	3,175
LC_Stream107	1.82	1,870	937	3,732
LC_Stream108	0.28	408	204	813



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Stream109	0.16	285	143	569
LC_Stream110	0.14	289	145	577
LC_Stream111	0.16	331	166	660
LC_Stream111	0.28	564	283	1,125
LC_Stream112	0.12	251	126	501
LC_Stream113	1.00	1,071	537	2,137
LC_Stream113	1.54	1,473	738	2,939
LC_Stream114	1.21	871	437	1,738
LC_Stream114	1.57	1,212	607	2,418
LC_Stream115	0.63	786	394	1,567
LC_Stream116	0.37	676	339	1,348
LC_Stream116	0.75	1,203	603	2,399
LC_Stream117	0.26	523	262	1,044
LC_Stream118	0.16	380	191	759
LC_Stream119	0.17	358	180	715
LC_Stream120	1.08	1,097	550	2,188
LC_Stream120	1.26	1,251	627	2,496
LC_Stream121	0.34	568	285	1,133
LC_Stream121	0.77	1,111	557	2,216
LC_Stream121	1.52	1,959	982	3,908
LC_Stream122	0.13	290	145	578
LC_Stream123	0.57	847	425	1,691
LC_Stream124	0.62	979	490	1,953
LC_Stream126	0.21	308	154	614
LC_Stream127	0.26	422	211	841
LC_Stream128	0.37	549	275	1,095
LC_Stream129	0.24	401	201	800
LC_Stream130	0.69	1,004	503	2,004
LC_Stream131	0.21	397	199	793
LC_Stream132	0.18	386	193	769
LC_Stream134	0.16	325	163	649
LC_Stream137	1.14	1,276	640	2,547
LC_Stream137	1.66	1,701	852	3,394
LC_Stream139	0.30	426	213	850
LC_Stream143	0.11	207	104	412
LC_Stream144	1.12	1,609	806	3,210
LC_Stream144	1.24	1,644	824	3,281
LC_Stream144	2.28	2,793	1,400	5,573



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
LC_Stream144	5.63	4,760	2,386	9,497
LC_Stream144	6.08	4,786	2,399	9,549
LC_Stream146	0.28	385	193	769
LC_Tupelo Branch	1.81	1,610	807	3,212
LC_Tupelo Branch	2.80	2,325	1,165	4,639
LC_Tupelo Branch	3.58	2,773	1,390	5,532
LC_Tupelo Branch	4.54	3,387	1,698	6,758
LC_Tupelo Branch	4.72	3,454	1,731	6,892
LC_Tupelo Branch	4.88	3,523	1,765	7,029
LC_Tupelo Branch	5.47	3,876	1,943	7,734
LC_Tupelo Branch	8.13	5,194	2,603	10,363
LC_Tupelo Branch	9.06	5,598	2,806	11,170
LC_Tupelo Branch	10.89	6,317	3,166	12,603
LC_Waxahachie Slough	1.09	1,382	693	2,757
LC_Waxahachie Slough	2.08	1,761	882	3,513
LC_Waxahachie Slough	2.57	2,071	1,038	4,133
Little Onion Creek	1.88	2,110	1,058	4,210
Little Onion Creek	4.32	4,127	2,068	8,235
Little Onion Creek	5.37	4,670	2,341	9,319
Little Onion Creek	6.99	5,455	2,734	10,885
Little Onion Creek	13.79	9,055	4,538	18,067
Little Onion Creek	16.21	10,165	5,095	20,282
Little Onion Creek	18.19	10,822	5,424	21,593
Little Onion Creek	19.33	10,936	5,481	21,819
Lone Elm Branch	1.29	1,805	905	3,602
Lone Elm Branch	1.56	2,156	1,081	4,302
Lone Elm Branch	2.45	3,118	1,563	6,222
Long Branch	1.13	1,343	673	2,681
Long Branch	1.29	1,435	719	2,863
Long Branch	2.11	2,055	1,030	4,101
Long Branch	2.67	2,464	1,235	4,917
Long Branch	4.00	3,058	1,532	6,101
Long Branch	6.28	4,352	2,181	8,683
Long Branch	6.87	4,569	2,290	9,116
Long Branch	8.20	4,969	2,490	9,914
Long Branch 2	1.00	1,264	634	2,522
Long Branch 2	2.47	2,800	1,404	5,588
Long Branch 2	3.07	3,008	1,508	6,002



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Long Branch 2	3.86	3,632	1,820	7,247
Long Branch 2	4.22	3,751	1,880	7,483
Long Branch 2	5.43	4,791	2,401	9,559
Long Branch 2	6.04	5,251	2,632	10,477
M Fork Chambers Creek	1.20	2,013	1,009	4,016
M Fork Chambers Creek	2.28	3,424	1,716	6,831
M Fork Chambers Creek	2.85	4,026	2,018	8,034
M Fork Chambers Creek	3.33	4,367	2,188	8,712
M Fork Chambers Creek	3.74	4,256	2,133	8,491
M Fork Chambers Creek	4.69	5,443	2,728	10,860
M Fork Chambers Creek	5.38	5,677	2,845	11,327
M Fork Chambers Creek	6.12	5,870	2,942	11,713
M Fork Chambers Creek	9.30	7,918	3,968	15,798
M Fork Chambers Creek	10.65	8,536	4,278	17,031
M Fork Chambers Creek	11.88	9,073	4,547	18,102
Mesquite Branch	1.48	2,656	1,331	5,299
Mesquite Branch	2.06	3,398	1,703	6,781
Mesquite Branch	2.45	4,350	2,180	8,679
Mesquite Branch	2.99	4,205	2,108	8,390
Mesquite Branch	3.65	5,319	2,666	10,614
Mesquite Branch	4.70	5,715	2,864	11,402
Mesquite Branch	5.22	5,633	2,823	11,239
Mesquite Branch	7.49	8,464	4,242	16,887
Mill Branch	1.37	1,613	808	3,218
Mill Branch	2.32	2,388	1,197	4,764
Mill Branch	3.32	3,065	1,536	6,116
Mill Branch	4.31	3,760	1,884	7,502
Mill Creek	1.00	1,703	854	3,399
Mill Creek	3.94	4,988	2,500	9,951
Mill Creek	4.51	5,454	2,734	10,883
Mill Creek	6.23	6,867	3,442	13,702
Mill Creek	7.12	7,470	3,744	14,904
Mill Creek	7.80	7,825	3,922	15,612
Mill Creek	9.58	8,147	4,083	16,256
Mill Creek	10.48	8,750	4,386	17,459
Mill Creek	11.06	9,008	4,515	17,973
Mill Creek	11.79	9,350	4,686	18,657
Mill Creek	12.72	9,838	4,931	19,630



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Mill Creek	12.86	9,977	5,000	19,907
Mill Creek	14.03	10,553	5,289	21,056
Mill Creek	14.52	10,843	5,435	21,635
Mill Creek	15.30	11,141	5,584	22,230
Mill Creek	15.45	11,198	5,612	22,343
Mill Creek	16.45	11,643	5,835	23,231
Mill Creek	16.98	11,886	5,957	23,715
Mill Creek	17.76	12,169	6,099	24,280
Mill Creek	18.18	12,296	6,163	24,534
Mill Creek	20.67	13,597	6,814	27,129
Mill Creek	22.86	14,504	7,269	28,938
Mill Creek	23.83	14,795	7,415	29,520
Mill Creek	24.08	14,795	7,415	29,520
Mill Creek	26.26	15,505	7,771	30,937
Mill Creek	27.26	15,626	7,831	31,177
Mill Creek	27.32	15,493	7,765	30,912
Mill Creek	29.89	16,176	8,107	32,275
Mill Creek	30.72	16,064	8,051	32,051
Mill Creek	33.24	16,345	8,192	32,613
Mill Creek	33.87	16,372	8,206	32,667
Mill Creek	38.51	18,026	9,035	35,967
Mill Creek	39.25	18,143	9,093	36,200
Mill Creek	40.86	18,316	9,180	36,546
Mill Creek	42.71	18,870	9,458	37,651
Mill Creek	43.39	19,007	9,526	37,924
Mill Creek	43.92	18,884	9,464	37,679
Mill Creek	44.48	18,899	9,472	37,708
Mill Creek	53.49	21,358	10,705	42,615
Mill Creek	64.79	24,257	12,157	48,398
Mill Creek	68.14	24,562	12,310	49,007
Mill Creek	79.67	27,270	13,667	54,411
Mill Creek	79.91	27,205	13,635	54,280
Mill Creek	87.18	28,788	14,428	57,440
Mill Creek	87.72	28,800	14,434	57,464
Mill Creek	95.29	31,196	15,635	62,243
Mill Creek	99.99	31,975	16,025	63,798
Mill Creek	108.51	32,743	16,410	65,331
Mill Creek	114.88	34,141	17,111	68,121

Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Mustang Creek	1.06	1,156	580	2,307
Mustang Creek	1.36	1,380	691	2,753
Mustang Creek	2.16	2,016	1,010	4,022
Mustang Creek	2.63	2,350	1,178	4,689
Mustang Creek	5.00	3,829	1,919	7,640
Mustang Creek	6.14	4,502	2,256	8,983
Mustang Creek	7.61	5,176	2,594	10,327
Mustang Creek	8.56	5,836	2,925	11,644
Mustang Creek	11.52	7,392	3,705	14,749
Mustang Creek	12.71	7,741	3,880	15,446
Mustang Creek	14.90	8,783	4,402	17,523
Mustang Creek	16.94	9,471	4,747	18,898
Mustang Creek	17.82	9,725	4,874	19,403
Mustang Creek	19.18	10,140	5,082	20,231
Mustang Creek	20.67	10,614	5,320	21,178
Mustang Creek	21.65	10,829	5,427	21,607
Mustang Creek	23.31	11,409	5,718	22,763
Mustang Creek	23.72	11,508	5,768	22,961
Mustang Creek	24.30	11,654	5,841	23,253
Mustang Creek	26.82	12,274	6,151	24,489
Mustang Creek	27.94	12,650	6,340	25,239
Mustang Creek	29.67	12,741	6,386	25,421
Mustang Creek	30.83	12,978	6,504	25,894
Mustang Creek	31.47	12,868	6,449	25,676
Mustang Creek Tributary	1.10	1,284	644	2,562
N Fork Chambers	1.07	1,444	724	2,882
N Fork Chambers	1.30	1,695	849	3,382
N Fork Chambers	1.34	1,676	840	3,344
N Fork Chambers	2.18	2,446	1,226	4,881
N Fork Chambers	3.15	3,337	1,672	6,658
N Fork Chambers	3.55	3,634	1,821	7,250
N Fork Chambers	4.16	3,905	1,957	7,791
N Fork Chambers	4.33	4,033	2,021	8,046
N Fork Chambers	5.77	5,106	2,559	10,189
N Fork Chambers	7.77	6,403	3,209	12,775
N Fork Chambers	8.34	6,538	3,277	13,044
N Fork Chambers	8.52	6,641	3,328	13,250
N Fork Chambers	9.25	7,213	3,615	14,393



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
N Fork Chambers	9.99	7,341	3,679	14,647
N Fork Chambers	10.70	7,542	3,780	15,048
N Fork Chambers	13.00	8,649	4,335	17,257
N Fork Chambers	13.79	8,824	4,423	17,606
N Fork Chambers	14.94	8,773	4,397	17,504
N Fork Chambers	19.05	10,061	5,042	20,074
N Fork Chambers	19.45	10,100	5,062	20,153
N Fork Chambers	19.91	10,125	5,074	20,201
N Fork Chambers	57.33	22,428	11,240	44,749
N Fork Chambers	61.22	23,098	11,576	46,087
N Fork Chambers	65.35	23,609	11,833	47,107
N Fork Chambers	68.88	22,136	11,094	44,166
N Fork Chambers	70.15	22,628	11,341	45,149
N Fork Chambers	73.71	22,728	11,391	45,349
N Fork Chambers	75.75	22,774	11,414	45,439
N Fork Chambers	84.92	29,660	14,865	59,180
N Fork Chambers	140.70	42,594	21,348	84,987
N Fork Chambers	142.34	42,385	21,243	84,569
N Fork Chambers	150.42	38,780	19,436	77,376
N Fork Chambers	158.45	40,121	20,108	80,053
N Fork Chambers	159.67	39,580	19,837	78,972
North Fork	1.39	2,479	1,242	4,945
North Fork	1.59	2,759	1,383	5,505
North Fork	1.82	3,037	1,522	6,059
North Fork	2.20	3,246	1,627	6,477
North Fork	2.97	3,693	1,851	7,368
North Fork	3.24	4,166	2,088	8,312
North Fork	3.32	4,183	2,096	8,346
North Prong Creek	0.36	501	251	999
North Prong Creek	0.69	931	467	1,858
North Prong Creek	1.07	1,364	684	2,721
North Prong Creek	1.78	2,030	1,018	4,051
North Prong Creek	2.33	3,001	1,504	5,987
North Prong Creek	4.04	4,734	2,373	9,445
North Prong Creek	4.30	4,887	2,449	9,750
North Prong Creek	4.49	5,050	2,531	10,075
North Prong Creek	5.05	5,266	2,639	10,508
North Prong Creek	5.45	5,304	2,659	10,584

Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
North Prong Creek	6.38	5,875	2,945	11,723
North Prong Creek	6.73	6,096	3,055	12,163
North Prong Creek	7.63	6,592	3,304	13,152
North Prong Creek	8.45	6,917	3,467	13,802
North Prong Creek	9.18	7,382	3,700	14,729
North Prong Creek	10.89	7,766	3,892	15,495
North Prong Creek	12.10	8,491	4,256	16,942
North Prong Creek	12.51	8,769	4,395	17,497
North Prong Creek	13.85	9,451	4,736	18,856
Oak Branch	1.57	2,657	1,332	5,301
Oak Branch	2.26	3,285	1,646	6,554
Oak Branch	3.22	4,382	2,196	8,743
Oak Branch	3.78	4,875	2,443	9,726
Oak Branch	5.00	5,929	2,971	11,830
Oak Branch	5.76	6,500	3,258	12,969
Oak Branch	6.66	7,023	3,520	14,012
Oak Branch	7.96	7,462	3,740	14,889
Rock Tank Creek	1.12	1,863	934	3,718
Rock Tank Creek	1.36	2,113	1,059	4,216
Rock Tank Creek	2.63	3,579	1,794	7,141
Rock Tank Creek	3.10	3,559	1,783	7,100
Rock Tank Creek	3.57	4,394	2,202	8,768
Rock Tank Creek	4.08	4,603	2,307	9,184
Rock Tank Creek	4.53	4,829	2,420	9,635
Rock Tank Creek	5.15	5,143	2,578	10,262
S Fork Chambers Creek	1.01	1,681	843	3,354
S Fork Chambers Creek	1.26	1,959	982	3,909
S Fork Chambers Creek	1.57	2,229	1,117	4,447
S Fork Chambers Creek	1.75	2,513	1,260	5,015
S Fork Chambers Creek	2.01	2,710	1,358	5,407
S Fork Chambers Creek	2.22	2,837	1,422	5,660
S Fork Chambers Creek	5.94	6,526	3,271	13,021
S Fork Chambers Creek	6.27	6,710	3,363	13,389
S Fork Chambers Creek	9.93	9,086	4,554	18,129
S Fork Chambers Creek	11.25	9,802	4,913	19,557
S Fork Chambers Creek	16.86	12,970	6,500	25,878
S Fork Chambers Creek	22.29	15,838	7,938	31,602
S Fork Chambers Creek	23.24	16,039	8,039	32,003



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
S Fork Chambers Creek	37.29	21,375	10,713	42,648
S Fork Chambers Creek	39.04	21,376	10,713	42,651
S Fork Chambers Creek	40.64	21,418	10,735	42,735
S Fork Chambers Creek	46.79	22,307	11,180	44,509
S Fork Chambers Creek	48.90	22,567	11,310	45,026
S Fork Chambers Creek	50.71	22,301	11,177	44,496
S Fork Chambers Creek	52.22	22,977	11,516	45,845
S Fork Chambers Creek	112.38	40,321	20,208	80,451
S Fork Chambers Creek	130.21	43,791	21,947	87,374
S Fork Chambers Creek	131.74	43,125	21,613	86,045
S Fork Chambers Creek	136.66	43,653	21,878	87,099
S Fork Chambers Creek	143.58	44,957	22,532	89,701
S Fork Chambers Creek	144.14	38,810	19,451	77,437
S Fork Chambers Creek	146.39	39,226	19,659	78,266
South Fork	1.01	1,670	837	3,332
South Fork	1.22	1,887	946	3,766
South Fork	1.67	2,383	1,194	4,755
South Fork	2.09	2,895	1,451	5,776
South Fork	2.66	3,454	1,731	6,892
South Fork	3.24	3,855	1,932	7,693
South Fork	4.24	4,633	2,322	9,245
South Fork	5.01	5,122	2,567	10,219
South Prong Creek	0.83	1,413	708	2,819
South Prong Creek	1.55	2,095	1,050	4,180
South Prong Creek	1.96	2,383	1,194	4,755
South Prong Creek	2.76	2,752	1,379	5,491
South Prong Creek	3.65	3,664	1,836	7,311
South Prong Creek	4.05	3,940	1,975	7,861
South Prong Creek	6.65	5,853	2,933	11,678
South Prong Creek	7.49	6,275	3,145	12,520
South Prong Creek	8.73	7,069	3,543	14,105
South Prong Creek	9.02	7,112	3,564	14,190
South Prong Creek	9.36	7,311	3,664	14,587
South Prong Creek	10.55	8,269	4,144	16,498
South Prong Creek	11.54	8,876	4,449	17,710
South Prong Creek	13.14	9,692	4,858	19,339
South Prong Creek	14.42	10,392	5,208	20,734
South Prong Creek	16.36	11,226	5,626	22,399

Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
South Prong Creek	20.51	13,184	6,608	26,305
South Prong Creek	22.46	13,811	6,922	27,557
South Prong Creek	24.92	14,320	7,177	28,572
South Prong Creek	27.75	15,460	7,748	30,847
South Prong Creek	28.80	15,761	7,899	31,446
South Prong Creek	30.20	16,337	8,188	32,597
Spring Branch	1.01	2,455	1,231	4,899
Spring Branch	1.67	3,534	1,771	7,051
Spring Branch	1.87	3,579	1,794	7,141
Spring Branch	2.35	3,961	1,985	7,904
Spring Branch	3.17	4,526	2,269	9,031
Spring Branch	3.44	4,801	2,406	9,580
Spring Branch	3.93	5,159	2,586	10,294
Stream017	1.05	2,114	1,060	4,218
Stream017	1.25	2,231	1,118	4,452
Stream018	1.14	1,699	852	3,391
Stream018	1.47	2,067	1,036	4,124
Stream018	1.89	2,380	1,193	4,749
Stream018	1.89	2,378	1,192	4,745
Stream019	1.08	2,115	1,060	4,221
Stream019	1.31	2,348	1,177	4,686
Stream019	1.52	2,498	1,252	4,984
Stream020	1.02	1,929	967	3,850
Stream020	1.40	2,389	1,197	4,767
Stream020	1.62	2,475	1,241	4,939
Stream020	2.02	2,886	1,446	5,758
Stream020	2.12	2,926	1,467	5,838
Stream020	3.44	4,198	2,104	8,376
Stream020	4.44	5,020	2,516	10,017
Stream020	4.88	5,218	2,615	10,412
Stream020	5.21	5,360	2,686	10,695
Stream021	1.06	1,917	961	3,825
Stream021	1.10	1,994	999	3,978
Stream022	1.21	1,663	833	3,318
Stream022	1.22	1,744	874	3,479
Stream022	1.44	1,985	995	3,960
Stream023	1.22	2,069	1,037	4,129
Stream023	1.58	2,319	1,162	4,627



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Stream023	2.08	2,802	1,404	5,591
Stream023	3.03	3,648	1,828	7,279
Stream023	3.36	3,779	1,894	7,541
Stream023	3.80	4,142	2,076	8,265
Stream023	4.38	4,615	2,313	9,209
Stream023	4.85	4,851	2,431	9,678
Stream024	0.79	1,485	744	2,964
Stream024	1.19	1,983	994	3,957
Stream024	1.32	1,982	994	3,955
Stream025	1.42	2,922	1,465	5,831
Stream025	1.58	2,828	1,417	5,642
Stream025	2.34	3,832	1,920	7,645
Stream025	2.67	4,106	2,058	8,192
Stream025	2.94	3,940	1,975	7,862
Stream027	1.05	1,509	756	3,011
Stream027	1.11	1,420	712	2,833
Stream027	1.91	2,791	1,399	5,569
Stream028	0.53	848	425	1,692
Stream028	1.41	1,877	941	3,746
Stream028	1.71	2,116	1,061	4,223
Stream028	1.92	2,309	1,157	4,608
Stream028	2.13	2,528	1,267	5,045
Stream029	1.00	1,263	633	2,519
Stream029	1.27	1,522	763	3,038
Stream029	1.45	1,780	892	3,552
Stream029	2.15	2,392	1,199	4,774
Stream029	3.00	3,116	1,562	6,217
Stream029	3.51	3,284	1,646	6,553
Stream029	4.05	3,720	1,864	7,423
Stream030	1.01	1,323	663	2,640
Stream030	1.21	1,501	752	2,995
Stream030	2.13	2,528	1,267	5,043
Stream030	2.76	3,068	1,538	6,122
Stream030	3.12	3,259	1,633	6,502
Stream030	3.39	3,477	1,743	6,938
Stream031	1.08	1,468	736	2,930
Stream031	1.61	2,076	1,041	4,143
Stream031	1.84	2,417	1,211	4,823



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Stream031	2.29	2,689	1,348	5,366
Stream036	1.30	1,979	992	3,949
Stream036	1.82	2,706	1,356	5,398
Stream036	2.08	3,200	1,604	6,384
Stream036	2.30	3,395	1,701	6,773
Stream037	1.03	2,192	1,098	4,373
Stream037	1.28	2,524	1,265	5,036
Stream037	1.47	2,699	1,353	5,386
Stream040	1.09	1,452	728	2,896
Stream040	1.44	1,787	896	3,566
Stream040	1.57	1,772	888	3,535
Stream042	1.38	1,493	748	2,979
Stream043	1.04	1,635	820	3,263
Stream043	1.34	1,871	938	3,733
Stream043	1.91	2,467	1,237	4,923
Stream043	2.17	2,521	1,264	5,030
Stream044	0.78	1,344	673	2,681
Stream044	1.61	2,339	1,172	4,667
Stream044	1.71	2,301	1,153	4,591
Stream047	1.00	1,207	605	2,408
Stream047	1.29	1,590	797	3,172
Stream047	1.45	1,692	848	3,376
Stream052	1.01	1,733	868	3,457
Stream052	2.00	3,077	1,542	6,139
Stream052	2.32	3,255	1,631	6,494
Stream052	2.60	3,488	1,748	6,959
Stream052	3.92	4,824	2,418	9,626
Stream052	4.54	5,100	2,556	10,176
Stream052	7.98	7,822	3,920	15,607
Stream052	8.71	8,138	4,079	16,237
Stream053	1.13	2,039	1,022	4,069
Stream054	1.02	1,832	918	3,656
Stream054	1.22	2,005	1,005	4,001
Stream054	2.60	3,531	1,770	7,045
Stream056	1.17	1,944	974	3,879
Stream056	1.26	1,935	970	3,861
Stream058	1.17	1,946	975	3,883
Stream059	1.05	1,722	863	3,435



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Stream059	1.58	2,179	1,092	4,348
Stream059	1.82	2,347	1,176	4,682
Stream061	1.01	1,671	838	3,335
Stream061	1.25	1,899	952	3,790
Stream062	0.80	1,057	530	2,108
Stream062	1.47	1,711	857	3,413
Stream062	2.37	2,551	1,279	5,090
Stream062	4.64	4,249	2,129	8,477
Stream062	5.13	4,469	2,240	8,917
Stream062	5.46	4,506	2,259	8,991
Stream062	5.67	4,866	2,439	9,709
Stream062	6.77	5,114	2,563	10,205
Stream062	7.16	5,704	2,859	11,381
Stream062	7.58	5,998	3,006	11,968
Stream062	9.17	6,758	3,387	13,485
Stream062	10.50	7,036	3,527	14,039
Stream063	1.09	1,267	635	2,529
Stream063	1.34	1,495	749	2,984
Stream063	1.84	1,927	966	3,845
Stream065	1.00	2,475	1,241	4,939
Stream065	1.57	3,358	1,683	6,701
Stream065	1.98	3,577	1,793	7,137
Stream065	3.91	6,173	3,094	12,316
Stream065	4.95	7,175	3,596	14,316
Stream065	5.51	7,314	3,666	14,593
Stream065	7.12	9,033	4,527	18,023
Stream065	8.42	9,462	4,742	18,878
Stream065	10.29	9,949	4,987	19,852
Stream065	15.80	13,333	6,682	26,602
Stream065	15.89	13,033	6,532	26,004
Stream066	0.91	2,239	1,122	4,467
Stream066	1.44	3,332	1,670	6,647
Stream066	1.88	3,850	1,930	7,683
Stream067	1.00	2,380	1,193	4,749
Stream067	1.30	2,755	1,381	5,497
Stream068	1.01	2,246	1,126	4,481
Stream068	1.39	2,912	1,460	5,811
Stream068	1.47	2,931	1,469	5,849



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Stream068	1.90	3,533	1,771	7,050
Stream068	1.98	3,587	1,798	7,156
Stream068	2.19	3,714	1,861	7,410
Stream068	4.55	6,676	3,346	13,320
Stream068	5.03	6,887	3,451	13,741
Stream069	1.03	2,117	1,061	4,224
Stream069	1.31	2,534	1,270	5,056
Stream069	1.50	2,811	1,409	5,608
Stream069	1.87	3,375	1,692	6,735
Stream069	2.00	3,525	1,767	7,033
Stream070	1.31	2,154	1,080	4,299
Stream070	1.43	2,274	1,140	4,538
Stream070	1.71	2,566	1,286	5,119
Stream070	3.00	3,992	2,001	7,965
Stream070	3.00	3,948	1,979	7,878
Stream071	1.04	1,815	910	3,622
Stream077	1.02	1,830	917	3,652
Stream078	1.03	1,536	770	3,064
Stream078	1.24	1,751	877	3,493
Stream078	1.63	2,135	1,070	4,261
Stream078	2.00	2,412	1,209	4,812
Stream078	2.39	2,733	1,370	5,454
Stream078	2.95	3,181	1,594	6,348
Stream079	1.00	1,556	780	3,105
Stream079	1.14	1,710	857	3,412
Stream079	1.44	2,089	1,047	4,168
Stream080	1.00	1,489	746	2,971
Stream080	1.34	1,874	939	3,740
Stream080	1.60	2,122	1,064	4,234
Stream080	2.00	2,460	1,233	4,908
Stream080	2.40	2,778	1,392	5,543
Stream080	2.74	2,908	1,457	5,801
Stream080	3.32	3,427	1,717	6,837
Stream081	1.04	1,464	734	2,921
Stream081	1.11	1,507	755	3,007
Stream081	1.15	1,537	770	3,067
Stream081	1.29	1,702	853	3,395
Stream081	1.37	1,768	886	3,527



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Stream081	1.94	2,448	1,227	4,884
Stream087	1.77	3,485	1,747	6,954
Stream087	2.28	4,033	2,021	8,048
Stream091	1.04	2,085	1,045	4,159
Stream091	1.14	2,180	1,093	4,350
Stream091	1.87	3,331	1,670	6,647
Stream091	2.22	3,574	1,791	7,132
Stream091	2.75	4,179	2,094	8,338
Stream091	3.02	4,323	2,167	8,625
Stream091	3.85	5,248	2,630	10,470
Stream091	4.18	5,356	2,684	10,687
Stream093	1.03	1,980	993	3,952
Stream093	1.18	2,197	1,101	4,384
Stream093	1.61	2,505	1,255	4,998
Stream093	2.07	2,945	1,476	5,876
Stream093	2.33	3,319	1,664	6,623
Stream093	2.82	4,159	2,085	8,299
Stream093	4.19	4,970	2,491	9,917
Stream1381	0.31	695	348	1,386
Stream1382	0.34	695	348	1,387
Stream1383	0.16	393	197	785
Stream1384	0.09	194	97	388
Stream1385	0.26	520	261	1,038
Stream1386	0.38	764	383	1,525
Stream1387	0.23	476	239	951
Stream1388	0.17	355	178	708
Stream1389	0.18	421	211	840
Stream1390	0.25	528	265	1,054
Stream1391	0.24	574	288	1,146
Stream301	0.70	1,221	612	2,435
Stream302	0.44	924	463	1,845
Stream303	0.14	386	193	770
Stream304	0.53	1,193	598	2,380
Stream307	0.57	1,106	555	2,208
Stream309	0.84	1,692	848	3,377
Stream310	0.67	1,162	583	2,319
Stream311	0.52	1,077	540	2,149
Stream311	0.85	1,680	842	3,352



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Stream312	0.32	778	390	1,553
Stream313	0.41	933	468	1,861
Stream314	0.31	654	328	1,306
Stream316	0.28	606	304	1,210
Stream318	0.47	981	492	1,958
Stream319	0.49	765	384	1,527
Stream320	0.92	1,554	779	3,101
Stream321	0.20	469	235	935
Stream322	0.99	1,404	703	2,801
Stream324	0.70	1,146	574	2,286
Stream325	0.55	1,014	508	2,023
Stream326	0.17	442	221	881
Stream331	0.34	636	319	1,268
Stream332	0.51	771	386	1,538
Stream334	0.78	1,049	526	2,093
Stream335	1.01	1,327	665	2,647
Stream336	0.47	877	439	1,749
Stream337	0.95	1,354	679	2,702
Stream338	0.63	1,035	519	2,066
Stream338	3.03	3,250	1,629	6,485
Stream342	0.85	1,209	606	2,412
Stream345	0.21	465	233	927
Stream348	0.71	840	421	1,677
Stream353	0.78	1,648	826	3,289
Stream355	0.57	1,068	535	2,131
Stream357	0.86	1,534	769	3,061
Stream357b	0.33	666	334	1,328
Stream357c	0.98	1,568	786	3,129
Stream359	0.78	1,211	607	2,415
Stream360	0.94	1,522	763	3,037
Stream361	0.42	822	412	1,640
Stream400	0.39	711	356	1,418
Stream402	0.34	619	310	1,235
Stream403	0.41	774	388	1,544
Stream405	0.22	361	181	720
Stream410	0.46	916	459	1,829
Stream410	0.65	1,150	576	2,294
Stream410	0.97	1,674	839	3,341



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Stream412	0.31	493	247	984
Stream413	0.10	266	133	531
Stream417	0.87	1,224	613	2,441
Stream435	1.00	1,185	594	2,364
Stream440	0.88	1,118	561	2,231
Stream442	0.15	314	158	627
Stream443	0.67	1,185	594	2,365
Stream447	0.17	378	189	754
Turkey Creek	1.00	1,889	947	3,769
Turkey Creek	1.13	2,023	1,014	4,037
Turkey Creek	1.73	2,806	1,406	5,598
Turkey Creek	3.17	4,646	2,329	9,270
Turkey Creek	5.82	7,678	3,848	15,319
Turkey Creek	6.31	8,055	4,037	16,071
Turkey Creek	7.36	8,326	4,173	16,613
Turkey Creek	8.18	8,877	4,449	17,711
Turkey Creek	9.86	9,990	5,007	19,933
Turkey Creek	15.27	13,921	6,977	27,776
Turkey Creek	17.22	14,601	7,318	29,133
Turkey Creek	18.28	14,695	7,365	29,321
Turkey Creek	23.87	17,318	8,679	34,554
Turkey Creek	25.19	17,978	9,010	35,871
Turkey Creek	28.72	19,228	9,637	38,365
Turkey Creek	29.94	20,125	10,086	40,154
Turkey Creek	31.66	19,987	10,017	39,879
Turkey Creek	35.11	20,290	10,169	40,484
Turkey Creek	37.07	20,416	10,232	40,736
UC_Stream003	0.61	955	479	1,905
UC_Stream004	0.81	1,375	689	2,744
UC_Stream005	1.01	1,737	871	3,466
UC_Stream005	2.01	2,973	1,490	5,931
UC_Stream005	2.24	3,088	1,548	6,162
UC_Stream005	3.23	4,078	2,044	8,136
UC_Stream005	3.31	4,109	2,059	8,199
UC_Stream007	0.58	1,153	578	2,300
UC_Stream007	0.88	1,530	767	3,052
UC_Stream008	0.20	511	256	1,019
UC_Stream010	0.71	1,243	623	2,481



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
UC_Stream011	0.07	234	117	467
UC_Stream012	0.14	388	194	774
UC_Stream013	0.11	352	177	703
UC_Stream014	0.33	712	357	1,421
UC_Stream014	0.58	1,171	587	2,337
UC_Stream014	0.92	1,763	884	3,518
UC_Stream015	0.24	619	310	1,235
UC_Stream016	0.16	430	215	857
UC_Stream017	0.46	1,063	533	2,121
UC_Stream018	0.16	511	256	1,020
UC_Stream019	0.50	850	426	1,695
UC_Stream020	2.29	2,861	1,434	5,708
UC_Stream020	3.29	3,843	1,926	7,668
UC_Stream020	4.28	4,521	2,266	9,022
UC_Stream020	5.24	5,001	2,506	9,979
UC_Stream021	1.91	2,964	1,486	5,914
UC_Stream023	1.30	1,838	921	3,667
UC_Stream025	0.72	1,266	635	2,526
UC_Stream026	0.45	971	487	1,937
UC_Stream027	0.25	578	290	1,154
UC_Stream027	0.42	886	444	1,769
UC_Stream028	0.12	319	160	636
UC_Stream029	0.47	978	490	1,952
UC_Stream030	0.16	431	216	860
UC_Stream031	0.90	1,283	643	2,560
UC_Stream031	1.90	2,444	1,225	4,876
UC_Stream031	2.47	2,997	1,502	5,979
UC_Stream032	0.57	991	497	1,978
UC_Stream033	0.26	549	275	1,096
UC_Stream034	2.09	2,529	1,268	5,047
UC_Stream035	0.71	1,276	640	2,546
UC_Stream036	1.60	2,609	1,307	5,205
UC_Stream036	1.92	2,891	1,449	5,768
UC_Stream037	0.70	1,130	566	2,255
UC_Stream038	1.44	1,756	880	3,503
UC_Stream038	2.44	2,759	1,383	5,506
UC_Stream038	3.21	3,398	1,703	6,780
UC_Stream038	4.08	3,962	1,986	7,905



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
UC_Stream038	4.44	4,215	2,112	8,409
UC_Stream038	5.35	4,677	2,344	9,331
UC_Stream038	5.89	4,963	2,488	9,903
UC_Stream039	0.55	788	395	1,573
UC_Stream041	0.90	1,430	717	2,853
UC_Stream043	0.74	945	474	1,886
UC_Stream044	0.63	841	421	1,678
UC_Stream045	0.71	995	499	1,985
UC_Stream047	0.24	407	204	812
UC_Stream048	0.38	596	299	1,188
UC_Stream049	1.00	914	458	1,823
UC_Stream049	1.93	1,724	864	3,439
UC_Stream049	2.80	2,287	1,146	4,564
UC_Stream049	3.60	2,744	1,375	5,476
UC_Stream049	4.58	3,210	1,609	6,404
UC_Stream049	5.41	3,533	1,771	7,049
UC_Stream049	8.36	4,609	2,310	9,195
UC_Stream049	10.26	5,284	2,648	10,543
UC_Stream049	12.55	6,089	3,052	12,150
UC_Stream049	13.52	6,633	3,325	13,235
UC_Stream049	13.95	6,678	3,347	13,324
UC_Stream049	14.89	6,967	3,492	13,900
UC_Stream049	15.60	7,159	3,588	14,284
UC_Stream049	17.62	7,823	3,921	15,609
UC_Stream050	0.42	623	312	1,243
UC_Stream051	1.10	1,220	611	2,434
UC_Stream051	2.00	1,832	918	3,656
UC_Stream052	0.69	899	451	1,795
UC_Stream052	1.00	1,227	615	2,448
UC_Stream052	1.17	1,289	646	2,571
UC_Stream053	0.29	467	234	932
UC_Stream054	1.09	1,392	698	2,778
UC_Stream054	1.32	1,591	797	3,174
UC_Stream055	0.66	893	447	1,781
UC_Stream055	0.94	1,241	622	2,476
UC_Stream056	0.19	330	166	659
UC_Stream057	0.40	530	266	1,057
UC_Stream057	0.78	1,010	506	2,016



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
UC_Stream058	0.23	443	222	883
UC_Stream059	1.82	813	408	1,623
UC_Stream060	1.00	1,079	541	2,153
UC_Stream060	2.18	2,124	1,065	4,239
UC_Stream060	2.27	2,215	1,110	4,420
UC_Stream060	3.78	3,471	1,740	6,925
UC_Stream062	1.15	1,137	570	2,268
UC_Stream064	2.27	3,227	1,617	6,438
UC_Stream065	1.23	2,269	1,137	4,528
UC_Stream066	0.65	1,224	614	2,443
UC_Stream067	0.64	1,029	516	2,054
UC_Stream068	1.03	1,930	967	3,850
UC_Stream068	1.14	2,037	1,021	4,065
UC_Stream069	0.90	1,369	686	2,732
UC_Stream070	0.44	1,109	556	2,213
UC_Stream071	0.39	737	369	1,471
UC_Stream072	0.86	1,532	768	3,056
UC_Stream073	0.80	1,267	635	2,527
UC_Stream073	1.01	1,542	773	3,076
UC_Stream074	0.45	861	431	1,718
UC_Stream074	0.49	941	472	1,877
UC_Stream075	0.36	643	322	1,283
UC_Stream075	0.55	935	469	1,866
UC_Stream076	0.12	321	161	640
UC_Stream077	0.52	1,134	568	2,262
UC_Stream077	0.72	1,441	722	2,875
UC_Stream078	0.51	1,062	532	2,119
UC_Stream079	1.01	1,323	663	2,639
UC_Stream079	1.46	1,757	881	3,507
UC_Stream079	2.46	2,778	1,392	5,543
UC_Stream080	0.89	1,163	583	2,320
UC_Stream081	0.67	901	451	1,797
UC_Stream081	1.03	1,329	666	2,652
UC_Stream081	1.24	1,585	795	3,163
UC_Stream082	0.25	428	215	854
UC_Stream083	0.77	971	487	1,937
UC_Stream083	1.42	1,693	848	3,377
UC_Stream084	0.21	339	170	677



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
UC_Stream085	1.02	1,265	634	2,524
UC_Stream085	1.60	1,802	903	3,595
UC_Stream086	1.15	1,209	606	2,412
UC_Stream086	1.71	1,741	873	3,475
UC_Stream087	2.22	1,828	916	3,647
UC_Stream087	3.16	2,458	1,232	4,905
UC_Stream087	4.09	2,955	1,481	5,896
UC_Stream087	4.63	3,235	1,621	6,455
UC_Stream088	0.66	815	408	1,626
UC_Stream090	1.00	1,067	535	2,130
UC_Stream090	1.70	1,742	873	3,475
UC_Stream091	0.66	780	391	1,557
UC_Stream093	1.24	1,650	827	3,293
UC_Stream093	2.09	2,413	1,209	4,814
UC_Stream094	1.00	1,467	735	2,928
UC_Stream094	1.10	1,528	766	3,049
UC_Stream096	1.03	1,193	598	2,381
UC_Stream096	1.40	1,531	767	3,055
UC_Stream097	1.00	1,297	650	2,588
UC_Stream098	1.91	1,755	879	3,501
UC_Stream098	2.61	2,217	1,111	4,424
UC_Stream099	0.94	1,103	553	2,201
UC_Stream099	2.02	1,986	995	3,962
UC_Stream099	3.69	3,165	1,586	6,316
UC_Stream099	4.62	3,643	1,826	7,269
UC_Stream099	7.56	5,424	2,719	10,823
UC_Stream100	0.67	844	423	1,683
UC_Stream101	1.06	1,188	595	2,370
UC_Stream101	1.18	1,273	638	2,540
UC_Stream102	0.59	821	411	1,638
UC_Stream103	1.08	1,185	594	2,364
UC_Stream103	1.50	1,415	709	2,822
UC_Stream103	2.90	2,437	1,221	4,862
UC_Stream104	0.69	840	421	1,675
UC_Stream104	1.03	1,131	567	2,256
UC_Stream105	0.28	440	220	877
UC_Stream107	2.11	2,234	1,120	4,458
UC_Stream107	3.08	2,840	1,423	5,666



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
UC_Stream107	4.03	3,452	1,730	6,888
UC_Stream107	5.03	3,999	2,004	7,979
UC_Stream107	5.16	3,929	1,969	7,839
UC_Stream107	5.96	4,388	2,199	8,755
UC_Stream107	6.48	4,782	2,397	9,541
UC_Stream108	0.54	818	410	1,633
UC_Stream109	2.06	2,797	1,402	5,581
UC_Stream109	2.32	2,895	1,451	5,776
UC_Stream109	3.30	3,695	1,852	7,372
UC_Stream109	4.44	4,552	2,282	9,083
UC_Stream109	5.19	5,077	2,544	10,129
UC_Stream109	6.10	5,638	2,826	11,250
UC_Stream109	6.88	5,934	2,974	11,840
UC_Stream110	0.82	1,184	594	2,363
UC_Stream111	0.57	886	444	1,769
UC_Stream112	0.61	1,006	504	2,008
UC_Stream112	0.65	1,027	515	2,049
UC_Stream113	1.02	1,625	815	3,243
UC_Stream113	1.34	1,856	930	3,703
UC_Stream113	1.82	2,441	1,223	4,871
UC_Stream113	3.46	4,268	2,139	8,515
UC_Stream114	1.14	1,603	803	3,199
UC_Stream114	1.63	2,036	1,021	4,063
UC_Stream115	1.01	1,541	773	3,076
UC_Stream115	1.78	2,293	1,149	4,574
UC_Stream115	3.49	3,711	1,860	7,404
UC_Stream116	1.21	1,885	945	3,760
UC_Stream116	1.39	2,005	1,005	4,001
UC_Stream117	2.05	2,333	1,169	4,655
UC_Stream117	2.88	2,718	1,362	5,423
UC_Stream117	3.83	3,577	1,793	7,138
UC_Stream117	6.37	5,206	2,609	10,387
UC_Stream118	1.28	1,741	873	3,474
UC_Stream118	1.49	1,954	980	3,900
UC_Stream119	1.24	1,180	592	2,355
UC_Stream120	2.04	2,303	1,154	4,595
UC_Stream120	2.78	3,005	1,506	5,995
UC_Stream121	1.58	1,318	661	2,631

Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
UC_Stream123	1.95	1,517	760	3,027
UC_Stream123	2.44	1,772	888	3,536
Valley Branch	1.63	3,200	1,604	6,384
Valley Branch	1.82	3,260	1,634	6,504
Valley Branch	2.94	4,678	2,345	9,334
Valley Branch	3.04	4,398	2,204	8,776
Valley Branch	5.40	7,025	3,521	14,016
Valley Branch	7.60	8,641	4,331	17,240
Valley Branch	8.07	8,681	4,351	17,320
Valley Branch	9.03	9,318	4,670	18,591
Valley Branch	9.59	9,298	4,660	18,551
Valley Branch	15.20	13,142	6,587	26,222
W Fork Weakly Branch	1.03	2,083	1,044	4,156
W Fork Weakly Branch	1.22	2,312	1,159	4,614
W Fork Weakly Branch	1.31	2,416	1,211	4,821
WAX S002	0.55	795	399	1,587
WAX S003	0.55	830	416	1,656
WAX S003	1.30	1,686	845	3,365
WAX S004	0.86	1,233	618	2,460
WAX S004	1.16	1,575	789	3,143
WAX S005	0.95	1,454	729	2,901
WAX S005	1.98	2,649	1,328	5,286
WAX S005	2.48	3,173	1,590	6,331
WAX S005	3.73	4,368	2,189	8,715
WAX S006	0.82	1,320	661	2,633
WAX S007	1.02	1,593	799	3,179
WAX S008	0.78	1,176	589	2,346
WAX S009	0.57	961	482	1,917
WAX S010	1.33	1,809	906	3,609
WAX S010	1.62	2,043	1,024	4,076
WAX S010	1.99	2,585	1,296	5,158
WAX S011	0.65	1,066	534	2,126
WAX S012	0.59	1,045	524	2,086
WAX S012	1.86	2,754	1,380	5,494
WAX S012	2.36	2,977	1,492	5,940
WAX S012	2.76	3,545	1,777	7,073
WAX S013	1.59	2,420	1,213	4,828
WAX S013	2.33	3,054	1,531	6,094



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
WAX S013	2.63	3,561	1,785	7,106
WAX S014	0.25	506	254	1,010
WAX S016	0.30	509	255	1,016
WAX S017	0.24	429	215	856
WAX S018	0.19	391	196	779
WAX S019	0.52	876	439	1,748
WAX S020	1.65	2,543	1,274	5,074
WAX S021	0.23	471	236	940
WAX S022	0.18	523	262	1,044
WAX S023	0.23	568	285	1,134
WAX S024	0.21	590	296	1,177
WAX S025	0.61	970	486	1,935
WAX S026	0.17	439	220	875
WAX S027	0.34	740	371	1,477
WAX S028	0.35	639	320	1,274
WAX S028	0.73	1,275	639	2,545
WAX S029	0.21	391	196	781
WAX S030	0.43	786	394	1,568
WAX S031	0.72	1,181	592	2,357
WAX S032	0.17	371	186	740
WAX S033	0.73	1,100	551	2,194
WAX S034	0.49	910	456	1,816
WAX S035	0.79	1,329	666	2,651
WAX S036	1.18	1,937	971	3,865
WAX S036	2.64	3,417	1,712	6,817
WAX S036	2.74	3,588	1,798	7,158
WAX S038	0.78	1,080	541	2,154
WAX S039	0.23	418	209	834
WAX S041	0.56	975	489	1,946
WAX S041	0.83	1,408	706	2,809
WAX S042	0.24	524	263	1,046
WAX S043	1.18	1,476	740	2,945
WAX S043	1.60	1,962	983	3,915
WAX S043	2.13	2,289	1,147	4,567
WAX S043	2.30	2,642	1,324	5,271
WAX S046	0.12	290	145	578
WAX S047	0.55	1,002	502	2,000
WAX S049	1.09	1,476	740	2,944



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
WAX S049	1.60	2,093	1,049	4,176
WAX S050	1.09	1,364	684	2,722
WAX S050	1.22	1,495	749	2,984
WAX S052	0.31	585	293	1,166
WAX S052	0.66	1,159	581	2,312
WAX S053	0.23	454	227	905
WAX S054	0.27	457	229	911
WAX S054	0.53	847	424	1,689
WAX S055	0.25	451	226	899
WAX S056	0.19	411	206	820
WAX S057	0.64	1,104	553	2,203
WAX S057	1.23	1,906	955	3,802
WAX S058	0.16	358	179	714
WAX S059	0.51	942	472	1,880
WAX S059	1.23	1,844	924	3,680
WAX S060	0.24	452	226	901
WAX S061	0.34	581	291	1,160
WAX S062	0.54	922	462	1,840
WAX S062	0.81	1,248	626	2,491
WAX S063	0.57	996	499	1,987
WAX S063	1.00	1,583	793	3,158
WAX S064	0.43	741	371	1,478
WAX S065	1.25	1,920	962	3,832
WAX S066	0.99	1,431	717	2,854
WAX S067	1.60	2,607	1,306	5,201
WAX S068	0.90	1,659	832	3,311
WAX S069	1.27	1,689	847	3,370
WAX S070	1.31	1,826	915	3,643
WAX S071	0.51	683	342	1,363
WAX S072	1.32	1,450	727	2,894
WAX S073	0.68	900	451	1,795
WAX S073	1.39	1,651	827	3,293
WAX S074	0.48	858	430	1,711
WAX S074	0.80	1,239	621	2,471
WAX S074	1.22	1,683	843	3,358
WAX S075	0.25	527	264	1,051
WAX S076	0.24	482	242	962
WAX S078	1.06	1,445	724	2,882



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
WAX S078	1.94	2,446	1,226	4,880
WAX S079	0.63	879	441	1,755
WAX S081	1.37	1,286	645	2,567
WAX S081	1.67	1,594	799	3,180
WAX S081	2.53	2,322	1,164	4,633
WAX S081	3.03	2,667	1,337	5,322
WAX S081	3.22	2,791	1,399	5,570
WAX S082	0.31	529	265	1,056
WAX S082	1.26	1,885	945	3,762
WAX S082	2.19	2,226	1,115	4,441
WAX S082	3.05	2,520	1,263	5,029
WAX S083	0.57	774	388	1,545
WAX S084	1.56	1,641	823	3,275
WAX S084	2.24	2,263	1,134	4,516
WAX S084	2.37	2,314	1,160	4,618
WAX S084	3.62	3,098	1,553	6,182
WAX S085	0.75	936	469	1,867
WAX S086	1.42	822	412	1,639
WAX S089	0.54	669	335	1,334
WAX S090	1.04	1,300	652	2,594
WAX S090	1.72	1,964	984	3,918
WAX S090	2.52	2,505	1,256	4,998
WAX S091	1.11	1,443	723	2,879
WAX S092	0.32	491	246	980
WAX S093	0.90	1,133	568	2,260
WAX S093	0.97	1,217	610	2,429
WAX S094	0.70	907	455	1,810
WAX S095	0.59	781	392	1,559
WAX S095	0.96	1,230	617	2,454
WAX S096	0.35	510	256	1,017
WAX S097	0.17	306	153	611
WAX S098	0.44	671	336	1,338
WAX S100	0.33	648	325	1,293
WAX S101	0.74	916	459	1,827
WAX S101	1.12	1,306	655	2,607
WAX S103	0.22	416	208	830
WAX S104	1.42	1,665	835	3,322
WAX S105	0.76	1,024	513	2,044



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
WAX S106	0.27	438	219	874
WAX S107	0.74	1,068	535	2,132
WAX S107	2.38	2,308	1,157	4,606
WAX S107	2.72	2,578	1,292	5,144
WAX S107	3.75	3,116	1,562	6,217
WAX S107	6.75	5,084	2,548	10,144
WAX S107	7.42	5,417	2,715	10,809
WAX S108	0.67	856	429	1,708
WAX S109	0.19	309	155	616
WAX S110	0.26	373	187	745
WAX S110	0.65	895	449	1,786
WAX S110	0.96	1,293	648	2,580
WAX S110	1.38	1,724	864	3,440
WAX S110	2.94	2,906	1,457	5,799
WAX S111	0.15	231	116	461
WAX S112	0.27	529	265	1,055
WAX S113	0.15	319	160	636
WAX S114	0.13	336	168	670
WAX S115	0.43	834	418	1,664
WAX S117	0.63	685	343	1,366
WAX S118	1.49	1,378	691	2,750
WAX S118	2.49	2,041	1,023	4,072
WAX S118	3.20	2,493	1,250	4,974
WAX S118	4.09	2,946	1,477	5,879
WAX S118	4.37	3,092	1,550	6,169
WAX S118	4.59	3,115	1,561	6,214
WAX S118	5.34	3,608	1,808	7,199
WAX S119	0.30	412	206	821
WAX S120	0.46	633	317	1,264
WAX S121	0.77	761	381	1,518
WAX S122	0.26	445	223	889
WAX S123	0.12	216	108	431
WAX S124	0.13	230	115	459
WAX S125	0.70	849	425	1,693
WAX S125	1.28	1,427	715	2,848
WAX S125	2.55	2,351	1,178	4,690
WAX S125	2.66	2,494	1,250	4,977
WAX S126	0.57	792	397	1,580



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
WAX S127	0.31	463	232	924
WAX S128	1.09	1,477	740	2,947
WAX S131	0.15	294	147	587
WAX S132	1.13	1,297	650	2,588
WAX S132	2.20	2,094	1,049	4,177
WAX S132	2.69	2,528	1,267	5,043
WAX S133	0.22	441	221	880
WAX S134	0.59	944	473	1,884
WAX S135	0.23	393	197	785
WAX S136	0.24	513	257	1,024
WAX S137	1.14	1,149	576	2,292
WAX S137	1.55	1,482	743	2,958
WAX S137	1.67	1,684	844	3,361
WAX S138	0.17	264	132	527
WAX S139	0.48	783	392	1,563
WAX S140	0.48	750	376	1,496
WAX S141	1.41	2,027	1,016	4,044
WAX S141	1.58	2,049	1,027	4,088
WAX S143	1.37	1,563	783	3,119
WAX S144	1.79	1,643	823	3,278
WAX S144	2.28	2,045	1,025	4,079
WAX S144	4.55	4,466	2,238	8,911
WAX S144	5.42	4,725	2,368	9,427
WAX S145	1.38	1,674	839	3,341
WAX S146	1.88	1,880	942	3,751
WAX S147	0.85	1,036	519	2,068
WAX S148	0.33	501	251	1,000
WAX S149	0.71	885	444	1,766
WAX S149	0.96	1,088	545	2,171
WAX S150	0.84	922	462	1,839
WAX S150	1.12	1,266	634	2,526
WAX S150	1.63	1,779	891	3,549
WAX S151	0.48	677	339	1,351
WAX S152	0.75	856	429	1,708
WAX S153	1.18	1,394	699	2,782
WAX S155	0.50	629	315	1,255
WAX S156	0.42	547	274	1,091
WAX S157	0.60	715	359	1,427



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
WAX S158	1.38	1,407	705	2,806
WAX S158	1.79	1,776	890	3,544
WAX S159	0.41	593	297	1,183
WAX S160	0.18	318	159	634
WAX S161	1.27	1,016	509	2,028
WAX S161	2.45	1,920	962	3,830
WAX S161	3.06	2,301	1,153	4,591
WAX S161	3.51	2,682	1,344	5,351
WAX S161	3.63	2,833	1,420	5,652
WAX S162	0.86	958	480	1,911
WAX S162	1.37	1,422	713	2,838
WAX S162	3.39	2,742	1,374	5,472
WAX S163	0.17	251	126	501
WAX S164	0.27	438	220	875
WAX S166	0.10	207	104	414
WAX S167	0.51	643	322	1,283
WAX S167	1.45	1,619	812	3,231
WAX S167	2.18	2,218	1,111	4,425
WAX S168	0.13	194	97	387
WAX S169	0.43	630	316	1,256
WAX S170	0.74	917	460	1,830
WAX S171	1.30	1,483	743	2,958
WAX S171	2.19	2,091	1,048	4,173
WAX S172	0.32	465	233	929
Waxahachie Creek	1.21	1,581	792	3,154
Waxahachie Creek	1.53	1,795	900	3,582
Waxahachie Creek	1.73	2,003	1,004	3,996
Waxahachie Creek	2.52	2,718	1,362	5,422
Waxahachie Creek	3.84	3,881	1,945	7,744
Waxahachie Creek	5.43	5,011	2,512	9,999
Waxahachie Creek	9.18	7,690	3,854	15,345
Waxahachie Creek	10.10	8,171	4,095	16,304
Waxahachie Creek	11.19	8,475	4,248	16,910
Waxahachie Creek	13.20	10,006	5,015	19,966
Waxahachie Creek	14.41	10,554	5,289	21,057
Waxahachie Creek	18.02	12,120	6,074	24,182
Waxahachie Creek	20.77	13,481	6,757	26,899
Waxahachie Creek	34.97	19,247	9,646	38,403



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Waxahachie Creek	36.29	19,378	9,712	38,663
Waxahachie Creek	39.10	20,325	10,187	40,554
Waxahachie Creek	45.67	22,303	11,178	44,499
Waxahachie Creek	48.28	23,095	11,575	46,081
Waxahachie Creek	52.98	23,931	11,994	47,749
Waxahachie Creek	55.44	24,501	12,280	48,886
Waxahachie Creek	57.94	24,910	12,485	49,702
Waxahachie Creek	59.29	24,940	12,500	49,762
Waxahachie Creek	60.74	24,997	12,528	49,876
Waxahachie Creek	62.48	25,332	12,696	50,544
Waxahachie Creek	63.94	25,313	12,687	50,506
Waxahachie Creek	65.34	25,485	12,773	50,849
Waxahachie Creek	66.16	25,185	12,622	50,250
Waxahachie Creek	67.34	25,243	12,652	50,367
Waxahachie Creek	68.65	25,166	12,613	50,212
Waxahachie Creek	98.99	32,631	16,354	65,108
Waxahachie Creek	100.68	32,785	16,431	65,414
Waxahachie Creek	101.96	32,841	16,459	65,526
Waxahachie Creek	103.72	32,485	16,281	64,817
Waxahachie Creek	105.90	32,483	16,280	64,813
Waxahachie Creek	107.36	32,769	16,424	65,384
Waxahachie Creek	108.70	32,670	16,374	65,185
Waxahachie Creek	114.08	32,504	16,290	64,854
Waxahachie Creek	117.24	33,990	17,035	67,819
Waxahachie Creek	121.18	34,287	17,184	68,412
Waxahachie Creek	122.08	34,403	17,242	68,642
Waxahachie Creek	123.85	34,502	17,292	68,841
Waxahachie Creek	155.78	40,556	20,326	80,920
Waxahachie Creek	163.44	41,786	20,943	83,375
Waxahachie Creek	166.52	40,857	20,477	81,520
Waxahachie Creek	168.15	40,907	20,502	81,620
Waxahachie Creek	173.64	41,759	20,929	83,319
Waxahachie Creek	174.37	41,877	20,988	83,555
Waxahachie Creek	177.55	42,019	21,059	83,839
Waxahachie Creek	179.12	41,740	20,919	83,282
Waxahachie Creek Tributary 1	0.74	1,240	622	2,475
Waxahachie Creek Tributary 1	1.04	1,586	795	3,165
Waxahachie Creek Tributary 2	1.04	1,630	817	3,252



Stream Name	Drainage Area (sq. mi)	1% Peak Q (cfs)	1%- Peak Q (cfs)	1%+ Peak Q (cfs)
Waxahachie Creek Tributary 2	1.37	1,978	991	3,946
Waxahachie Creek Tributary 2	2.21	2,915	1,461	5,815
Waxahachie Creek Tributary 3	1.11	1,474	739	2,941
Waxahachie Creek Tributary 3	1.31	1,590	797	3,173
Waxahachie Creek Tributary 3	1.42	1,890	947	3,771
Weakly Branch	4.34	837	419	1,669
Weakly Branch	5.09	1,791	897	3,573
White Rock Branch	1.00	1,150	577	2,295
White Rock Branch	1.23	1,403	703	2,799
White Rock Branch	1.94	2,106	1,055	4,202
White Rock Branch	2.41	2,472	1,239	4,933
White Rock Branch	3.83	3,595	1,802	7,173
White Rock Branch	4.52	3,989	1,999	7,959
Wolf Branch	0.58	976	489	1,947
Wolf Branch	1.74	2,067	1,036	4,125
Wolf Branch	1.86	2,228	1,116	4,445



Appendix B BLE Maps

