GEOLOGY

Physiographic Region

The entire state of Missouri has three of the major physiographic provinces of the United States: the Central Lowlands, the Interior Highlands, and the Coastal Plains. The Gasconade River watershed lies within the Ozark Plateau of the Interior Highlands. Further subdivision of the Ozark Plateau places the watershed within the Salem Plateau whose elevation is between 1000 - 1400 feet above mean sea level.

Geology

Surface geologic formations are composed of dolomite and sandstone of the Ordovician Age. All geologic formations in the watershed are part of the Canadian Series (MDNR 1979). Tributary streams and the main stem Gasconade River cut through a member of the Gunter Sandstone, the Gasconade Formation. This formation has many springs that contribute to the base flow of the main stem Gasconade River. As one moves out of the floodplain toward the uplands, the Gasconade Formation is replaced by the Roubidoux Formation that contains sandstone and cherty dolomite. Farther upland, within the headwaters of the Gasconade River are a composite of Smithville Formation, Powell, Cotter, and Jefferson City dolomites. Rocks in these formations tend to be more weathered with cracks, joints, and solution openings.

Losing Streams

A losing stream is defined as a stream that loses 30 percent or more of its flow into an aquifer within two miles of flow discharge (MDNR Clean Water Commission Water Quality Standards 10 CSR 20-7.01, 1994). Permeable rock type is responsible for the movement of water to subsurface levels. Most of the watershed has well sustained base flows. The karst topography causes losing portions in the Osage Fork, Roubidoux, North Cobb, Little Piney, Spring, and Mill creeks, and Gasconade River (MDNR 1986). Approximately 33 miles of the central portion of the Gasconade River comprises the longest losing segment in the watershed (Table 1). The Roubidoux, Corn, and Little Piney creeks have 16, 12.5, and 12 miles of losing stream, respectively. These subwatersheds are more densely populated with springs than other subwatersheds.

Soil Associations

The collective pattern of soils with their associated relief and drainage makes the Gasconade River watershed a unique natural landscape. The general soils map (Figure 2) is useful for planning on a large scale; more detailed maps can be found in NRCS county soil surveys for small scale planning, such as farm or field management or project site selection.

The Gasconade Watershed traverses three land resource areas: Deep Loess Hills, Ozarks, and Ozark Border. The Deep Loess Hills is found mostly in the northwestern part of the state. Some of the soil deposits are found on ridgetops and broad uplands, but the thickest deposits of loess are found along river bluffs with decreasing thickness away from the bluffs. The Gasconade River has one association, Menfro-Winfield-Haymond, in this resource area along the Missouri River. The Ozarks Land Resource Area is found in the southern part of the state. Soils of this resource area cover a broader soil category and greater number of associations. Not only were soils formed in alluvium along narrow bottomland areas, but most soil formations were under forest vegetation with an occasional tall grassy open area or

glade area. Ozark Border soils are located in the southeastern part of Missouri. This area was formed under the same conditions as the Ozarks. The bottomland areas tend to have gravelly alluvium soils rather than cherty alluvium soils. Both the Ozarks and the Ozark Border areas have fragipans that tend to restrict plant root growth.

Soil Types

The soil associations in the Gasconade River watershed have several major soil types. These soil types determine soil uses and the distribution of vegetation types.

The Clarksville series consists of those soils found in level to steep terrain, steep-side slopes and narrow ridges, that has good drainage. Formed in a residuum cherty dolomite, the surface soils are a dark grayish-brown cherty dolomite. Deeper layers are a more pale to reddish silt loam and increase in clay content. Because of Clarksville's hazard for draughtiness, thus low moisture holding capacity, most of this series is forested.

The Lebanon series are moderately well drained soils on level or sloping areas. Soil is silty in its upper layers and cherty fragipan in lower layers. The surface layers are dark grayish-brown silt loam and at a depth of about 24 inches is the fragipan. Clay content increases below 31 inches creating a strong-brown silty clay. Most of the soils are in pasture and some hardwood areas remain.

Formed in cherty colluvium, the Viraton series consists of well drained soils with cherty fragipan. They are sloping to moderately steep. Surface layers are brown cherty silt loam. A cherty silty clay loam exists to 18 inches and a thick fragipan follows. Below the 18-inch fragipan is a yellowish-red silt loam. Like the Lebanon series low moisture holding capacity creates drought conditions. Idle areas and pasture make up most of this series.

Found in floodplains, the Haymond series is very deep and well drained silt loam. Surface layers are dark grayish brown silt loam. Deeper layers vary only slightly in color. Flooded during brief periods, these soils are cultivated for corn, soybeans, and wheat, and some small areas are wooded.

Erosion Potential

The Soil Conservation Service (now know as the Natural Resources Conservation Service (NRCS)) in a 1977 National Erosion Inventory estimated that the soil loss from sheet erosion amounts to 2.7 tons/acres/year in the Gasconade River watershed (Anderson 1980). In the same survey, sheet and rill erosion, involving the removal of thin layers of soil from an area by water, and creating channels about 30 centimeters in depth, in the Gasconade River watershed did not exceed allowable limits of 2.5 - 5 tons/acre/year on pasture land; however, sheet and rill erosion did reach 18 - 24 tons/acre/year on tilled land (Anderson 1980). Twenty tons per year is equivalent to one-eighth of an inch of soil. For comparison, in forest soils, with many roots to maintain soil integrity, losses in the Gasconade River watershed are 0.25 - 0.5 tons/acre/year. Gully erosion problems, extreme soil losses causing trenches that exceed 30 centimeters in depth, are moderate in the Gasconade River watershed. Actual sediment reaching streams is low (0.8 tons/acre/year) in comparison to other watersheds in the state.

Watershed Area

The drainage of the Gasconade Watershed excluding the Big Piney River covers 1,797,130 acres or 2806.9 square miles (Table 2). The watershed is approximately 130 miles long. Considerably wider at the

upper reaches, 50 miles wide, the watershed narrows north of the 38E latitude to approximately 10 miles in width (Vandike 1995). The major tributaries such as Third Creek, Roubidoux River, Little Piney Creek, Upper Osage Fork, and Lower Osage Fork have drainage areas of 64,910, 181,220, 190,720, 214,960, and 109,440 square miles, respectively.

Stream Order

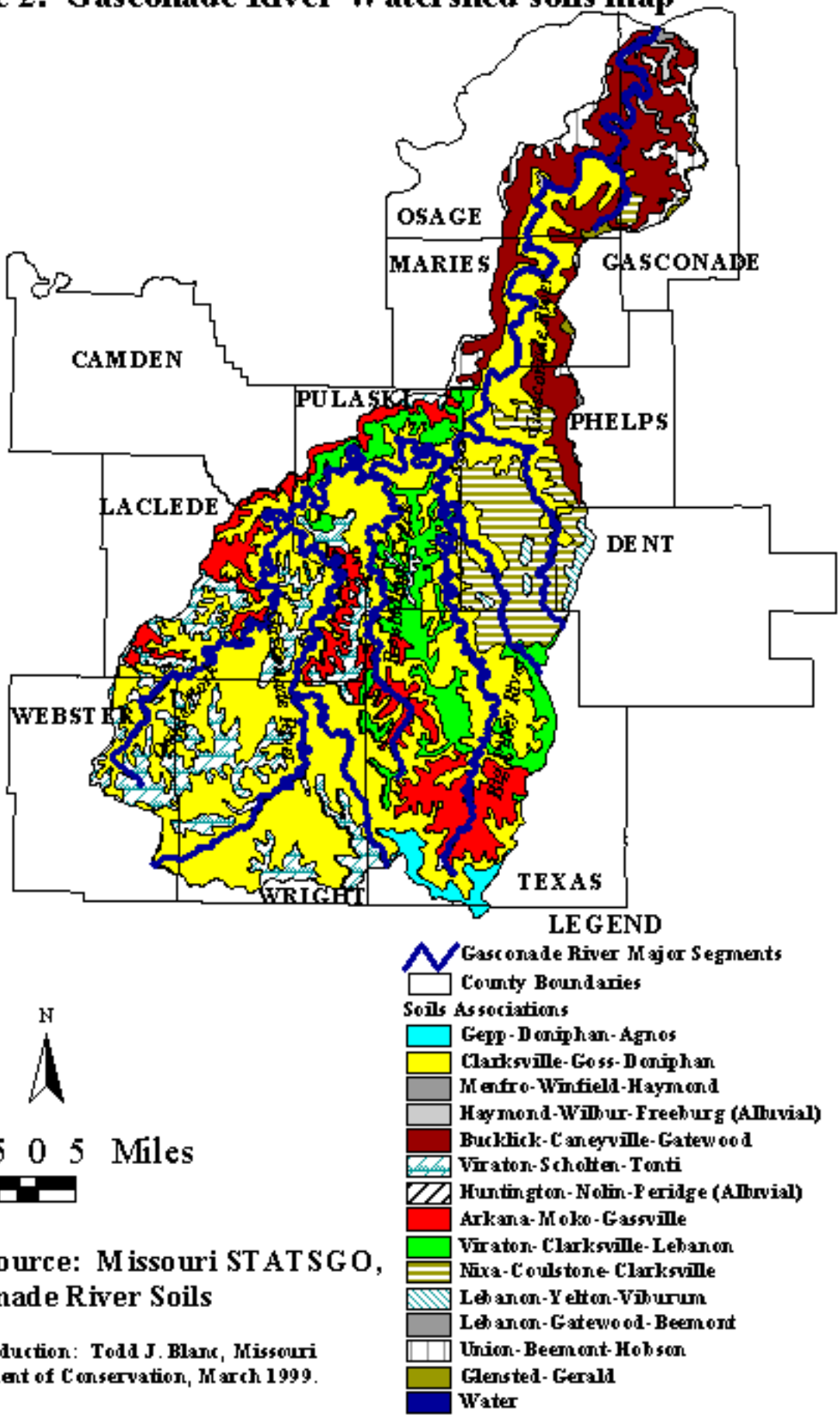
Stream order was determined using a system of classification that was first defined by Horton (1945) and later modified by A. N. Strahler (1952). Strahler called all unbranched tributaries first-order streams; two first-order streams join to make a second-order stream, and so on downstream to the stream mouth. MDC East Central Region Fisheries personnel determined stream gradient and stream order (Table 7) from United States Geological Survey (USGS) 1:24,000-scale topographic maps (Table 3) for all third-order and greater streams within the Lower Gasconade River watershed (HUC # 10290203) and all fourth-order and greater streams within the Upper Gasconade River watershed (HUC # 10290201).

Stream Gradient

East Central Region Missouri Department of Conservation biologists collected elevation and distance data from USGS 7.5 minute topographic maps (usually 20-feet contours). Gradient by stream order and watershed were tabulated, measuring the vertical drop over a given distance for the number of streams that were fourth-order or greater. When comparing stream gradient between stream systems, the average value provides a useful means of summarizing this type of continuous data. Average gradient for the Upper Gasconade River watershed is 27.6 feet/mile, and the average gradient for the Lower Gasconade River watershed is 3.9 feet/mile. The last mile of the upper Gasconade River more than doubles in gradient from 101.1 feet/mile to 218.9 feet/mile. Little Piney Creek has an average gradient of 46.8 feet/mile. Roubidoux Creek has an average gradient of 6.9 feet/mile from its mouth to the confluence with the East Fork and West Fork Roubidoux Creek, which have average gradients of 60.1 and 58.1 feet/mile, respectively. The Osage Fork and Beaver Creek have gradients that average 25.7 and 20.1 feet/mile.

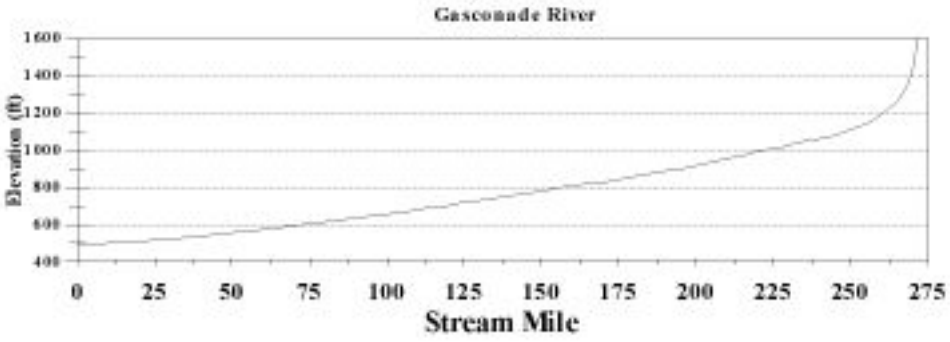
Gradient plots are useful for understanding channel steepness in relation to geology. The relief of the land influences drainage, runoff, and other factors such as erosion. The gradient of the river decreases downstream, so the overall profile is a hyperbolic curve that decreases in gradient downstream (Figure 3). Within a watershed, gradient plots for all fourth-order or greater streams were created. A plot of the entire Gasconade River and its major tributaries shows relatively moderate gradient (Figure 3).

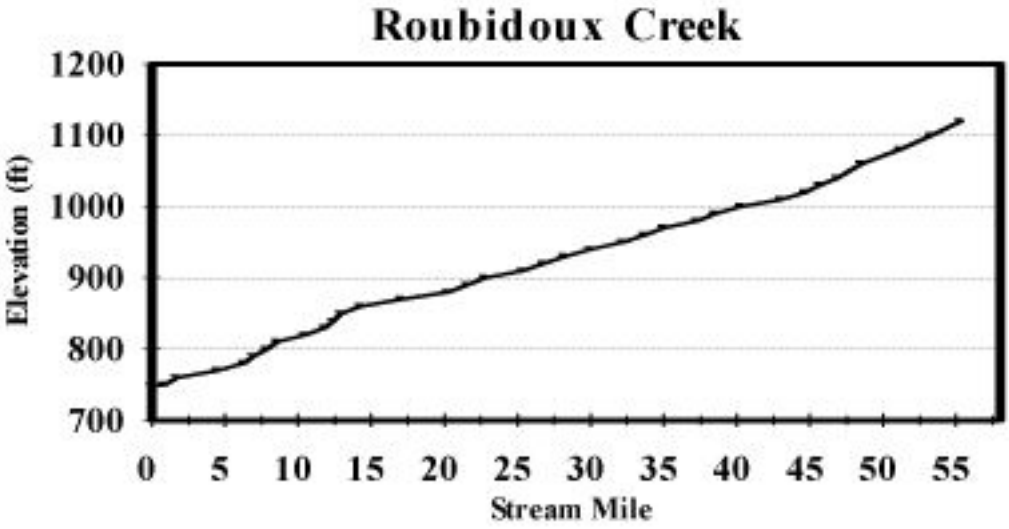
Figure 2. Gasconade River Watershed soils map

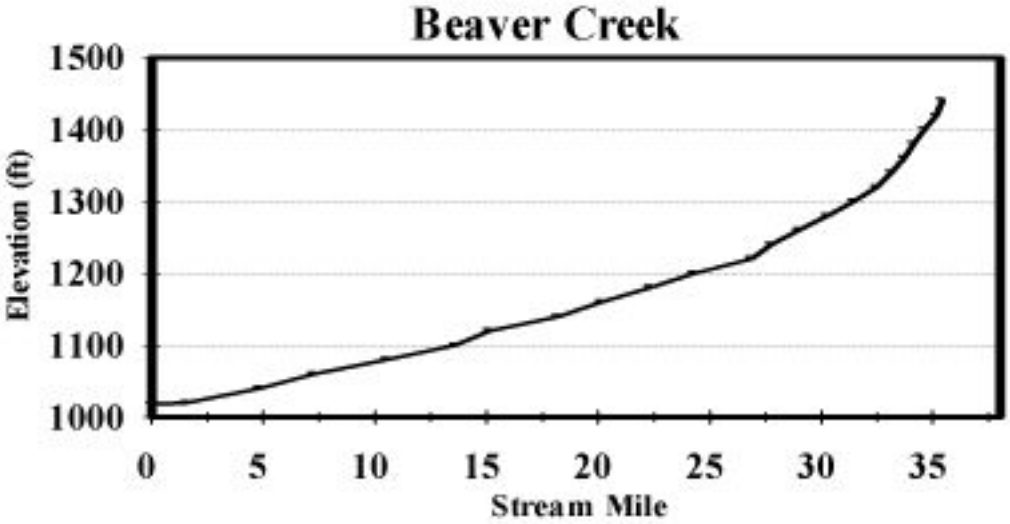


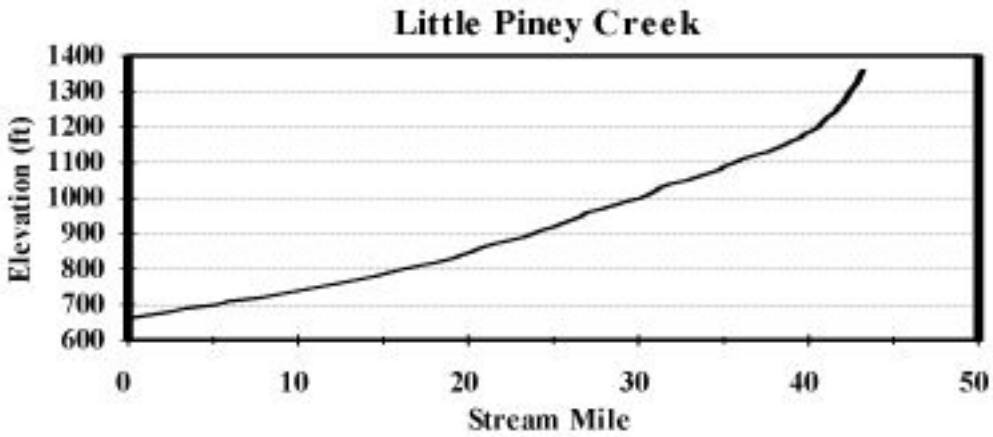
Data source: Missouri STATSGO, Gasconade River Soils

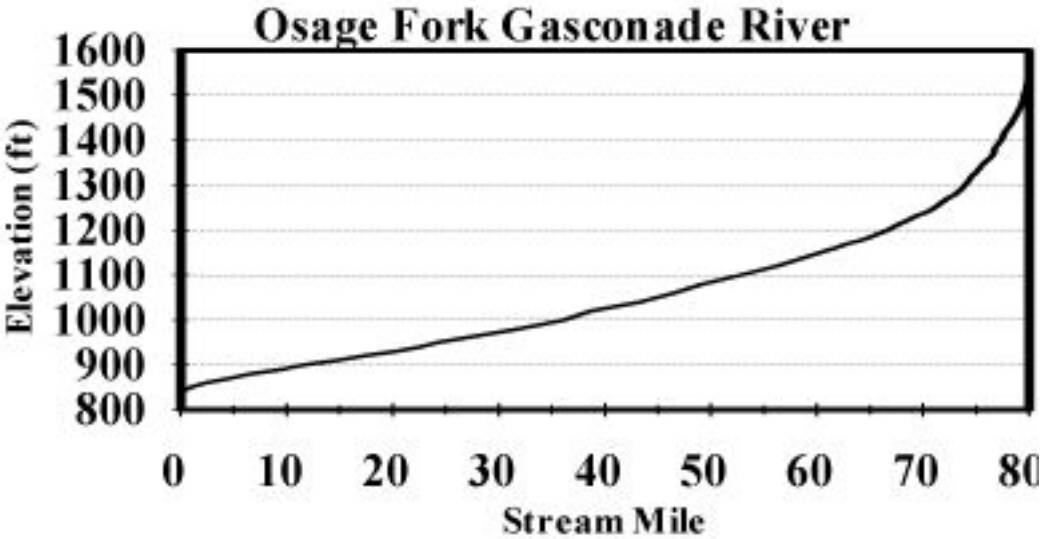
Map Production: Todd J. Blanc, Missouri Department of Conservation, March 1999.


Gasconade River
Elevation (ft)
1600
1400
1200
1000
800
600
400
0
25
50
75
100
125
150
175
200
225
250
275
Stream Mile


Roubidoux Creek
Elevation (ft)
1200
1100
1000
900
800
700
0
5
10
15
20
25
30
35
40
45
50
55
Stream Mile


Beaver Creek
Elevation (ft)
1500
1400
1300
1200
1100
1000
0
5
10
15
20
25
30
35
Stream Mile





Gradient of selected tributaries to Gasconade River.

Table 1. Gasconade River watershed losing stream reaches sorted by county. Listed streams are over 5.0 miles in length. Compiled by the MDNR Division of Geology and Land Survey 1992.

Stream Name	County	Length of Segment	Legal Start	Legal End
Finn Creek	Dent	5.0	SE NE NE 6 35N 7W	SW NW SE 4 35N 8W
Horse Creek	Dent	5.0	NE NE SW 32 35N 7W	SW SW NE 22 35N 8W
Gasconade River	Laclede	33.7	NW NW NE 11 35N 14W	SE SE NW 15 36N 12W
Mill Creek	Laclede	4.0	SW SW SW 9 34N 15W	SE NE SW 1 34N 15W
North Cobb Creek	Laclede	7.3	NE NW NE 18 34N 15W	NE SW NE 2 33N 15W
Osage Fork	Laclede	6.0	NE NW SW 7 32N 15W	NE NW NW 33 33N 15W
Corn Creek	Phelps	12.5	SW SE NE 2 34N 9W	NE NE SE 35 36N 9W
Little Piney Creek	Phelps	12.0	SE SW SE 6 34N 8W	SW NW SE 4 35N 8W
Roubidoux Creek	Pulaski	16.0	SW NW SW 3 34N 12W	NW NE SW 8 36N 12W
Collie Hollow	Pulaski	8.2	NW SE NE 24 35N 13W	SE NW SE 17 36N 12W
Smith Branch	Pulaski	9.0	SW SE NE 8 34N 11W	NW SE SW 7 35N 11W

Stiens Creek	Wright	8.8	SW SW SW 22 31N 15W	NW NE NE 22 32N 15W
Elk Creek	Wright	5.0	SW NE NW 8 31N 14W	NW SE NE 26 32N 14W

Table 2. Drainage area of major watersheds, Gasconade River watershed, Missouri (Watersheds in Missouri, USDA, NRCS, 1990). The hydrologic unit (HU) code - 10290201 and 10290203 - is the prefix to the 11-digit HU (USGS, NRCS) code.

USGS Code	Watershed	Max. Order	Area (acres)	Area (sq. mi)	% of watershed
01-010	**Upper Gasconade River**	5	232,320	362.8	12.9
01-020	**Beaver Creek**	5	85,120	132.9	4.7
01-030	**Upper Osage Fork**	5	214,960	335.7	12.0
01-040	**Lower Osage Fork**	5	109,440	170.9	6.1
01-050	**Upper Gasconade River Tributaries**	6	150,400	234.9	8.4
01-060	**Roubidoux River**	5	181,220	283.1	10.1
01-070	**Middle Gasconade River**	6	155,520	242.9	8.7
03-010	**Little Piney Creek**	5	190,720	297.9	10.6
03-020	**Lower Gasconade River**	7	221,430	345.9	12.3
03-030	**Third Creek**	5	64,910	101.4	3.6
03-040	**Lower Gasconade River Hills**	7	191,090	298.5	10.6
	Total Gasconade River watershed		1,797,130	2806.9	

Table 3. .Gasconade River watershed (except Big Piney River) streams and the corresponding topographic maps that each stream flows through.

Stream Name	Topo Map
Gasconade River	Gasconade, Morrison, Fredericksburg, Pershing, Goerlisch Ridge, Cooper Hill, Linn, Summerfield, Paydown, Vienna, Nagogami Lodge, Newburg and Dixon
HUC[1] # 10290203-040	
First Cr.	Gasconade, Pershing, Swiss
-Brushy Fr.	Gasconade, Pershing
-Unnamed Cr.	Gasconade, Pershing, Swiss, Hermann
--Unnamed Cr.	Swiss
Unnamed Cr.	Fredericksburg
Richland Cr.	Fredericksburg, Pershing
Unnamed Cr.	Pershing
Second Cr.	Pershing, Goerlisch Ridge, Rosebud
-Puncheon Cr.	Pershing, Swiss
--Unnamed Cr.	Pershing, Swiss
-Schulte Cr.	Goerlisch Ridge, Rosebud
Unnamed Cr.	Fredericksburg
Pin Oak Cr.	Cooper Hill, Goerlisch Ridge
Hope Cr.	Fredericksburg
Unnamed Cr.	Fredericksburg

Contrary Cr.	Cooper Hill, Fredericksburg, Luystown
Deer Slough	Cooper Hill, Linn
Pointers Cr.	Cooper Hill, Linn
-North Fork	Linn
Owens Cr.	Cooper Hill, Linn
Indian Cr.	Linn, Summerfield
Swan Cr.	Linn, Westphalia East
-Lake Ditch	Linn, Westphalia East
--Graveyard Br.	Linn, Westphalia East
HUC # 10290203-030	
Third Cr.	Cooper Hill, Goelisch Ridge, Rosebud, Owensville East
-Little Third Cr.	Cooper Hill, Belle
-Crider Cr.	Cooper Hill, Belle
--Old Bland Cr.	Belle, Owensville West
--Unnamed Cr.	Belle
-Hunke Cr.	Goerlisch Ridge
-Cedar Branch	Goerlisch Ridge, Owensville West, Owensville East
--Unnamed Cr.	Goerlisch Ridge, Owensville West
-Brushy Branch	Goerlisch Ridge, Rosebud
-Unnamed Cr.	Goerlisch Ridge, Rosebud

Mistaken Cr.	Cooper Hill, Belle, Summerfield
HUC # 10290203-020	
Brush Cr.	Linn, Westphalia East
-Unnamed Cr.	Linn, Summerfield, Freeburg
-Buchler Cr.	Westphalia East, Freeburg
--Bexten Br.	Westphalia East
Unnamed Cr.	Summerfield
Buck Elk Cr.	Summerfield, Belle
Reichel Cr.	Summerfield, Freeburg
Unnamed Cr. (Steuber Hol.)	Summerfield, Freeburg
Whalen Cr.	Summerfield, Freeburg
Unnamed Cr.	Summerfield, Paydown
Hatchee Cr.	Summerfield, Belle
Mill Cr.	Paydown
-Unnamed Cr.	Paydown
Long Cr.	Paydown
Boardman Cr.	Paydown, Vienna, Freeburg
Crumb Cr.	Vienna
Indian Cr.	Vienna
Irish Cr.	Vienna
Cedar Cr.	Paydown

Spring Cr.	Vienna, Paydown, Vichy, Rolla, Dillon
-Little Spring Cr.	Vichy, Paydown
-Rocky Br.	Vichy
-Mill Cr.	Vichy
-Unnamed Cr.	Vichy
-Unnamed Cr.	Vichy, Rolla
Jim Cr.	Vienna, Nagogami Lodge
Sweetwater Cr.	Nagogami Lodge
Dry Cr.	Nagogami Lodge, Big Bend
-Montague Cr.	Nagogami Lodge, Big Bend
-Doyle Cr.	Nagogami Lodge
-Unnamed Cr.	Nagogami Lodge, Big Bend
Gaines Ford Br.	Nagogami Lodge, Vichy
Unnamed Cr. (Bloom Hol.)	Nagogami Lodge, Vichy
Camp Cr.	Nagogami Lodge, Vichy, Rolla
-Mill Cr.	Nagogami Lodge, Newburg, Rolla
Tick Cr.	Nagogami Lodge, Newburg, Rolla
Unnamed Cr. (Clifty Hol.)	Nagogami Lodge, Big Bend
-Little Clifty Cr.	Nagogami Lodge, Big Bend
-Unnamed Cr.	Big Bend
Duncan Cr.	Newburg, Dixon, Big Bend

-Unnamed Cr. (Dobbs Hol.)	Newburg, Nagogami Lodge, Big Bend
Mill Cr.	Dixon
HUC # 10290203-010	
Little Piney Cr.	Newburg, Rolla, Kaintuck Hollow, Yancy Mills, Edgar Springs, Maples
-Unnamed Cr. (Tater Hol.-Smith Hol.)	Newburg, Dixon, Devils Elbow
-Mill Cr.	Newburg, Kaintuck Hollow, Flat
--Unnamed Cr. (Kaintuck Hol.)	Kaintuck Hollow
--Unnamed Cr. (Hardester Hol.)	Kaintuck Hollow, Devils Elbow
--Unnamed Cr. (Deep Hol.)	Kaintuck Hollow
-Unnamed Cr.	Newburg
-Beaver Cr.	Rolla, Yancy Mills
--Little Beaver Cr.	Rolla
--Iron Ore Cr.	Rolla, Yancy Mills
-Corn Cr.	Yancy Mills, Kaintuck Hollow, Flat, Edgar Springs
-Kitchens Br.	Yancy Mills, Edgar Springs
-Finn Br.	Yancy Mills, Lecoma
-Horse Cr.	Edgar Springs, Anutt
--Bean Cr.	Edgar Springs, Anutt
--Unnamed Cr.	Edgar Springs, Anutt
-Jackson Br.	Edgar Springs

-Black Oak Cr.	Edgar Springs
-Everywhere Br.	Edgar Springs
-Sample Cr.	Edgar Springs, Maples
-Unnamed Cr.	Maples
-Unnamed Cr.	Maples
-Unnamed Cr.	Maples
Unnamed Cr. (Prewett Hol.)	Dixon
HUC # 10290201-060	
Roubidoux Creek	Waynesville, Bloodland
-unnamed, trib to Roubidoux., Sec.24	Waynesville
-unnamed, trib. to Roubidoux, Sec. 24	Waynesville
--unnamed, trib. to unnamed, Sec. 35	Waynesville
-Burchard Hollow	Waynesville
-Ballard Hollow	Waynesville
-Smith Hollow	Waynesville, Bloodland
--unnamed cr., trib. to Smith Hollow, Sec 32	Bloodland
-York Hollow	Waynesville, Ozarks Springs
-Elliot Hollow	Bloodland, Brownfield
-Killman Hollow	Bloodland
-Hurd Hollow	Bloodland

-unnamed cr., trib. to Roubidoux, Sec. 3	Bloodland, Brownfield
-unnamed cr., trib. to Roubidoux, Sec. 14	Bloodland, Roby
-Muskgrave Hollow	Bloodland, Roby
--unnamed cr., trib. to Muskgrave Hollow	Bloodland, Roby
-unnamed cr., trib. to Roubidoux Cr.	Roby
-Rock Creek	Roby, Roubidoux
--Baker Branch	Roby
--unnamed cr., trib. to Rock	Roby
--unnamed cr., trib. to Rock	Roby
-Prairie Creek	Roby, Winnipeg, Manes
-unnamed Cr., trib. to Roubidoux	Roby
-Dolittle Creek	Roby, Roubidoux, Winnipeg
-Mill Creek	Roubidoux, Manes
-Coghill Hollow	Roubidoux
-Burkhart Branch	Roubidoux
-Wolf Branch	Roubidoux
West Fork Roubidoux Creek	Roubidoux, Huggins
-unnamed cr., trib. to W. Fork Roubidoux Cr.	Roubidoux, Huggins
-unnamed cr., trib. to W. Fork Roubidoux Cr.	Roubidoux, Huggins
-unnamed cr., trib. to W. Fork Roubidoux Cr.	Roubidoux, Huggins
East Fork Roubidoux Creek	Roubidoux, Success, Bucyrus

-Carr Branch	Roubidoux, Success
-unnamed cr., trib. to E. Fork Roubidoux Cr.	Success
HUC # 10290201-070	
Weeks Creek	Devils Elbow
Jones Creek	Dixon, Hancock
Clemens Creek	Hancock
Bell Creek	Hancock
-Sewell Creek	Hancock
-Middle Creek	Hancock
unnamed, trib to Gasco. R., Sec. 5	Hancock
Grills Hollow	Waynesville
Sawmill Creek	Waynesville
Tower Hollow	Waynesville
Collie Hollow	Ozarks Springs, Brownfield
-unnamed cr., trib. to Collie Hollow	Ozarks Springs
Crumley Br.	Crocker
Snake Creek	Ozark Springs, Crocker
unnamed cr., trib. to Gasco. R., Sec. 35	Ozark Springs
Laquey Hollow	Ozark Springs, Brownfield
-unnamed cr., trib. to Laquey Hollow	Ozark Springs, Richland
-unnamed cr., trib. to Laquery Hollow	Ozark Springs

-unnamed cr., trib. to Laquery Hollow	Ozark Springs
unnamed cr., trib. to Gasco. R., Sec. 14	Waynesville
Duck Creek	Richland
Bear Creek	Stoutland, Richland, Oakland
-Sandy Creek	Richland, Stoutland
-unnamed cr., trib. to Bear Cr.	Stoutland, Oakland
-Spud Hollow	Stoutland, Oakland
unnamed cr., trib. to Gasco. R., Sec. 16	Richland
HUC # 10290201-050	
Prairie Creek	Drynob, Brownfield
Bell Branch	Drynob, Brownfield
Core Creek	Drynob, Brownfield
unnamed cr., trib. to Gasco. R., Sec 1	Brownfield
unnamed cr., trib. to Gasco. R., Sec 1	Brownfield
Cantrel Hollow	Brownfield
unnamed cr., trib. to Gasco. R., Sec 14	Brownfield
unnamed cr., trib. to Gasco. R., Sec 22	Brownfield
Nelson Creek	Brownfield, Winnipeg
-unnamed cr., trib. to Nelson Br., Sec. 30	Winnipeg
unnamed cr., trib. to Gasco. R., Sec. 34	Winnipeg, Drew
Kuhn Creek	Winnipeg

Mill Creek	Winnipeg
-unnamed cr., trib to Mill Ck., Sec. 24	Winnipeg
Big Sleepy Hollow	Winnipeg, Drew
Burnt Cabin Hollow	Winnipeg, Drew
Pine Creek	Winnipeg, Manes
Norris Creek	Winnipeg, Manes
unnamed cr., trib. to Gasco. R., Sec. 30	Drew
unnamed cr., trib. to Gasco. R., Sec. 6	Drew
unnamed cr., trib. to Gasco. R., Sec. 7	Competition, Manes
Elk Creek	Competition, Fuson
-unnamed cr., trib. to Elk Cr., Sec. 25	Competition
-unnamed cr., trib. to Gasco. R., Sec. 8	Competition, Grovespring
-Scotts Branch	Competition, Grovespring, Hartville
Crooked Creek	Fuson, Hartville
Dry Creek	Fuson, Dawson
Greene Hollow	Fuson, Dawson
Garner Hollow	Fuson
HUC # 10290201-040	
Osage Fork, trib. to Gasco. R.	Drynob, Oakland, Drew, Russ, Grovespring
-Murrel Hollow	Drynob

-Similin Creek	Drynob
-Mill Creek	Drynob, Oakland
--unnamed cr., trib. to Mill Cr., Sec. 1	Oakland
--unnamed cr., trib. to Mill Cr., Sec. 1	Oakland
--Morgan Hollow	Oakland
--Abbott Hollow	Oakland
-North Cobb Creek	Drynob, Drew, Russ, Brush Creek, Oakland, Lebanon
--Bee Branch	Oakland, Drew, Russ
--unnamed cr., trib. to N. Cobb Cr., Sec 34	Russ
--unnamed cr., trib. to N. Cobb Cr., Sec 27	Russ, Oakland
--South Fork North Cobb Creek	Oakland, Russ, Brush Creek
--unnamed cr., trib to N. Cobb Cr., Sec 30	Oakland, Lebanon
-Core Creek	Drynob, Drew
-Walker Hollow	Drynob, Drew
-Little Cobb Creek	Drew
-Cobb Creek	Drew, Grovespring
HUC # 10290201-030	
-Stein Creek	Russ, Grovespring, Hartville
--Barn River	Russ, Grovespring
--unnamed cr., trib. to Stein Cr., Sec 22	Grovespring, Hartville

-Sharpe Hollow	Russ
-Brush Creek	Russ, Brush Creek
--Wildcat Hollow	Brush Creek
--unnamed cr., trib. to Brush Cr., Sec. 26	Brush Creek
--Selvage Creek	Brush Creek
-unnamed cr., trib. to Brush Cr., Sec 32	Brush Creek
-unnamed cr., trib. to Osage Fk., Sec. 6	Russ, Brush Creek
-Parks Creek	Russ, Grovespring, Rader, Hartville
--Rocky Hollow	Rader
--Buttrom Creek	Grovespring, Rader, Duncan
--unnamed cr., trib. to Brush Cr., Sec. 30	Grovespring, Rader, Duncan
-unnamed cr., trib. to Osage Cr., Sec. 15	Rader, Lebanon
-Panther Creek	Rader, Niangua
--Salem Springs Creek	Niangua, Phillipsburg
---unn'd cr., trib. to Salem Springs Cr., Sec. 11	Phillipsburg
-Myers Branch	Rader
-Little Bowen Creek	Niangua
-Bowen Creek	Niangua
-Cantell Creek	Niangua, Rader, Duncan, Mansfield NW
--Hyde Creek	Rader, Duncan, Hartville
--unnamed cr., trib. to Cantell Cr., Sec. 18	Duncan, High Prairie

-Hannah Creek	High Prairie, Mansfield
-unnamed cr., trib. to Osage Cr., Sec. 17	High Prairie
HUC # 10290201-020	
Beaver Creek	Competition, Manes, Dawson, Mountain Grove North, Cabool
-Moore Hollow	Manes
-Flanery Branch	Manes
-unnamed cr., trib to Beaver Cr., Sec 24	Manes
-Hattie Hollow	Dawson
-North Fork Beaver Creek	Dawson, Huggins
--Sycamore Creek	Dawson, Huggins
-Williams Branch	Mountain Grove North, Cabool NW
-Hillhouse Hollow	Competition, Fuson
HUC # 10290201-010	
Whetstone Creek	Fuson, Owens, Mountain Grove North, Mountain Grove South
-Dove Creek	Fuson, Dawson, Mountain Grove North
--Prairie Hollow	Dawson
-unnamed cr., trib to Whetstone Cr., Sec. 16	Mountain Grove North
-East Whetstone Creek	Mountain Grove North
--Drake Creek	Mountain Grove North
-unnamed cr., trib. to Whetstone Cr., Sec 28	Mountain Grove North, Owens, Norwood

Coon Creek	Fuson, Hartville
Clark Creek	Fuson, Owens, Norwood
-Carter Branch	Owens
-unnamed cr., trib to Clark Cr., Sec. 25	Owens
Indian Creek	Fuson, Hartville
-Brush Creek	Fuson, Hartville
Evening Shade Branch	Fuson, Owens
Woods Fork	Fuson, Hartville, Mansfield NE, Duncan, Mansfield NW
-Prairie Branch	Mansfield NE, Hartville
-Little Creek	Hartville
-Bowman Creek	Hartville, Duncan
Campbell Branch	Mansfield NE, Owens
Quillen Branch	Owens
Gasconade River (Lick Fork)	
-Wolf Creek	Mansfield NE, Mansfield
--Long Hollow	Mansfield NE, Owens
--Spence Creek	Mansfield NE, Mansfield
--Fry Branch	Mansfield NE, Mansfield, Norwood
-Buck Hollow	Mansfield NE, Mansfield NW
-Baker Creek	Mansfield NE, Mansfield NW, Cedar Gap

-Rippee Hollow	Mansfield NW
--unnamed cr., trib. to Rippee Creek, Sec 4	Mansfield NW
-unnamed cr., trib. to Gasco. R. (Lick), Sec 27	Mansfield NW
[1] **Hydrologic Unit Code**	