

GEOMORPHOLOGY

Physiographic Region/Geology/Soil Type

The Niangua Watershed lies in the Salem Plateau subdivision of the Ozark Plateau physiographic region. The watershed is underlain with several hundred feet of Ordovician and Cambrian rock, largely dolomite (Harvey et al., 1983). The edges of the watershed lie in Jefferson City-Cotter dolomite, while streams cut into progressively older Roubidoux, Gasconade, and Eminence formations (MDNR, 1984). There is considerable subsurface movement of water in the watershed through solution dissolved channels in the fractured and jointed dolomite. As a result, karst features such as caves, sinkholes, losing streams, and springs are abundant. Streams which incise into the middle or lower Gasconade have well sustained base flows even during dry periods, due to ample groundwater supplies (MDNR, 1984). Streams which incise into the Roubidoux formation are frequently losing streams and sinkholes are common (Harvey et al., 1983). Soils in the watershed are classified as residual, alluvial, colluvial, and loess (Harvey et al., 1983). Residual soils consist primarily of material weathered from cherty dolomite, dolomite, and sandstone, and occur on the surface of steep slopes. When they develop in uplands from Roubidoux formations, and Jefferson City - Cotter dolomites, an impervious fragipan usually occurs 18 to 24 inches below the surface. Colluvial soils, which are soils deposited on lower valley slopes by erosion from more elevated sites, are limited in abundance. Alluvial soils are those transported by streams and deposited on level or gently sloping areas in flood plains. They range in size from silt to gravel. Loess soils are silty, windblown material which commonly occur on ridgetops.

Watershed Area

The watershed area of the entire watershed is 1,040 square miles. The LNR watershed is 320 square miles, which is approximately one-third of the drainage of the entire watershed. Watershed areas for all fourth order and larger streams and some third order streams are shown in Table 2. The watersheds of fourth order streams are delineated in Figure 3. Approximately 500 acres of the Niangua Watershed is within Benton County, 164,000 within Camden County, 279,000 within Dallas County, 49,000 within Hickory County, 96,000 within Laclede County, and 69,000 within Webster County.

Stream Order

Stream order was determined from 7.5 minute topographic maps for all streams in the watershed. The NR has two fifth order and 14 fourth order tributaries. The LNR has one fifth order and six fourth order tributaries. Table 2 lists all third order and larger streams in the Niangua Watershed. Table 3 lists the total mileage of third order and larger streams, and the portions inundated by LOZ and Lake Niangua.

Channel Gradient

Stream gradients were determined for all third order and greater streams from the 7.5 minute topographic maps shown in Figure 4 and a table of elevations and average gradients is presented in Appendix C. Gradient plots were also created, but they are not included in this document. The average gradient of the Lower Niangua River is 3.9 feet per mile, the Upper Niangua River is 5.4 feet per mile, and the Little Niangua River is 9.4 feet per mile.

Figure 3. Watersheds of fourth order streams within the Niangua River Watershed.

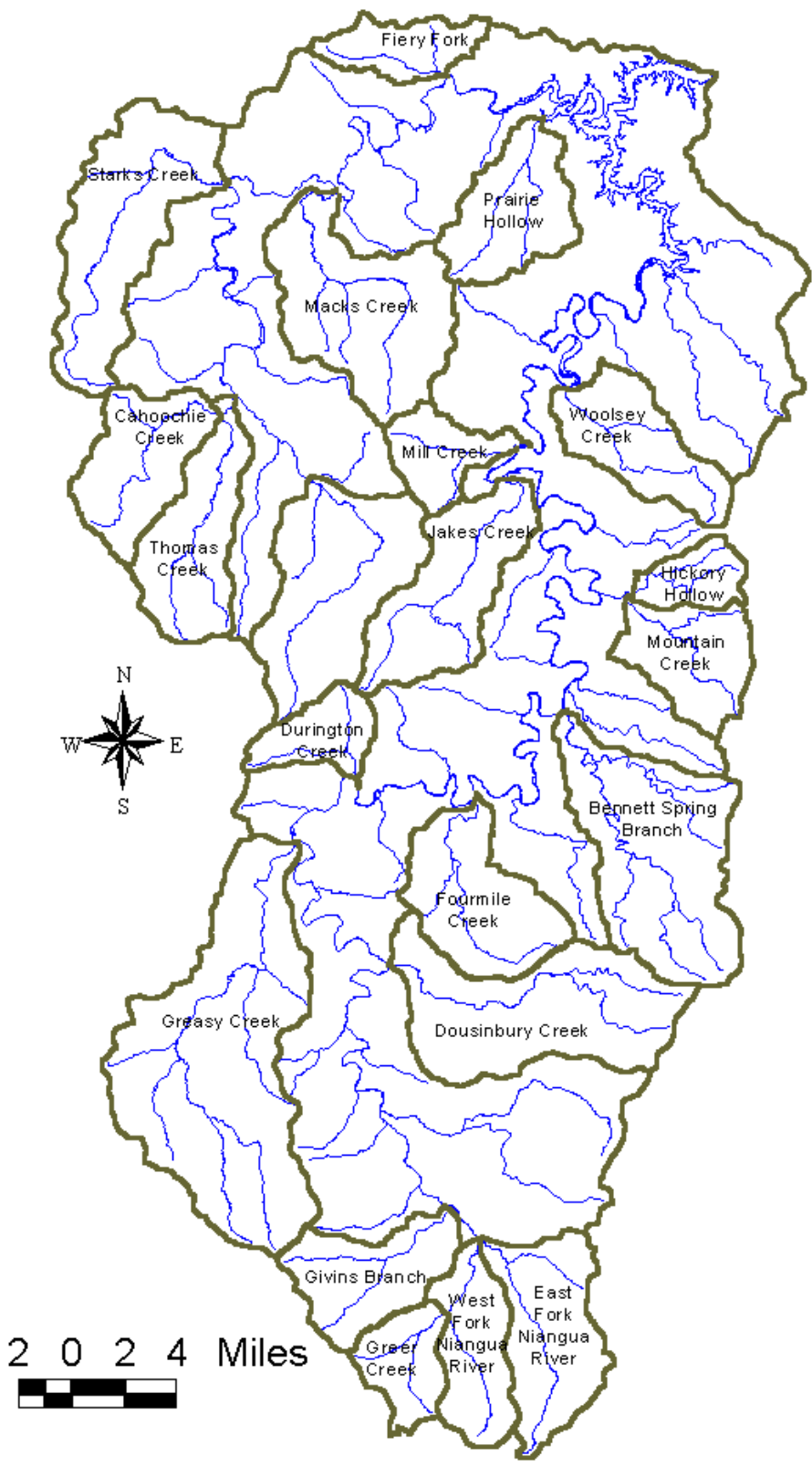


Figure 4. 7.5 topographic maps that include the Niangua Watershed.

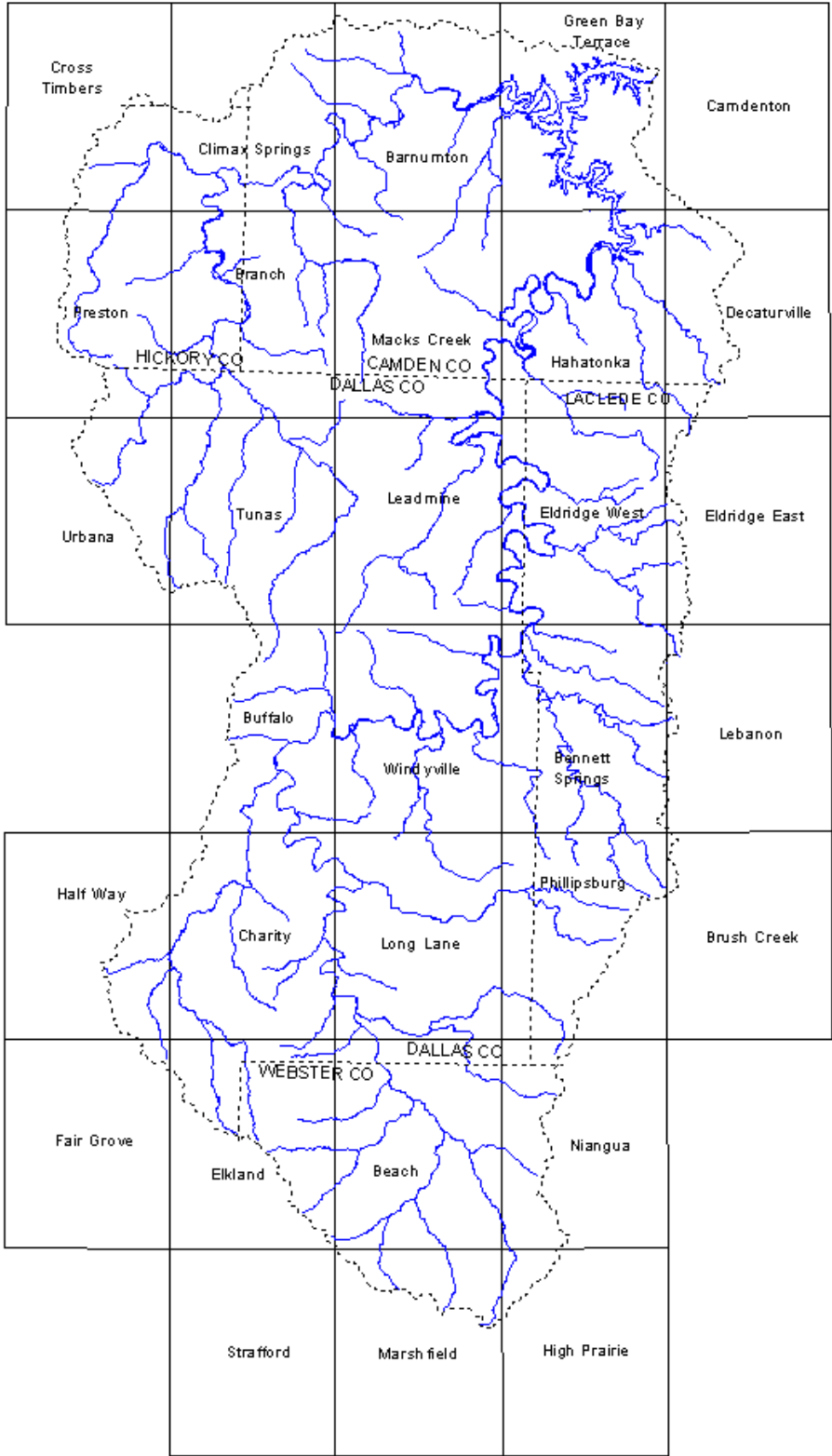


Table 2. Stream code, name, order, length, watershed area, and location for third order and larger streams within the Niangua Watershed.

Code Number	Stream	Order	Length	Length to Headwater	Watershed Area	Receiving Stream	Stream Mile	Length Inter-mittent
44300000	Niangua River	6	54.4	129.0	1,040.0	Osage River	- -	0.0
44312000	Racetrack Hollow	3	4.5	6.8	7.9	Niangua River	13.6	4.2
44314000	Spencer Creek	3	2.8	7.5		Niangua River	15.2	0.0
44315000	Bank Branch	3	6.8	9.5		Niangua River	15.4	0.0
44318000	Broadus Branch	3	2.1	3.4		Niangua River	27.4	0.0
44321000	Woolsey Creek	4	2.1	9.4	19.7	Niangua River	32.0	0.0
44321000	Woolsey Creek	3	5.1	6.7		Woolsey Creek	0.0	0.0
44321100	Brushy Creek	3	0.9	2.8		Woolsey Creek	2.1	0.0
44323000	Mill Creek	4	2.4	5.1	12.1	Niangua River	38.7	0.0
44323000	Mill Creek	3	1.8	5.5	2.3	Mill Creek	0.0	0.7
44323200	Brush Creek	3	1.1	2.6		Mill Creek	2.4	0.1
44324000	Jakes Creek	4	7.3	12.0	27.1	Niangua River	41.2	0.0
44324000	Jakes Creek	3	1.8	4.6		Jakes Creek	0.0	0.0
44324100	Tom Lock Hollow	3	0.7	2.8	2.4	Jakes Creek	7.3	0.0
43250000	Sweet Hollow	3	2.4	4.4	8.0	Niangua River	47.3	0.0
44326000	Halsey Hollow	3	1.3	4.8	5.2	Niangua River	50.3	0.0
44320000	Niangua River	5	64.7	64.7		Niangua River	0.0	0.0
44327000	Mountain Creek	5	1.5	9.6	27.7	Niangua River	54.4	0.0
44327000	Mountain Creek	4	2.2	7.6	23	Mountain Creek	0.0	0.0

Table 3. Mileage of third order and larger streams, including inundated sections within the Niangua Watershed.

Stream Order	Number of Streams	Total Length (mi.)	Inundated Lenth¹ (LOZ)(mi.)	Inundated Lenth² (Lake Niangua) (mi.)
3	80	189.4	1.1	
4	23	104.3	0.8	
5	4	110.7	10.1	
6	1	54.4	19.8	2.3

¹ Total length inundated by Lake of the Ozarks (impounded in 1931).

² Total length inundated by Lake Niangua (impounded in 1929).

44327000	Mountain Creek	3	3.4	4.9		Mountain Creek	0.0	0.0
44327200	N_N01	3	2.2	3.7		Mountain Creek	3.7	2.1
44327100	Hickory Hollow	4	2.0	4.7	6.1	Mountain Creek	1.5	1.9
44327100	Hickory Hollow	3	0.9	2.7		Hickory Hollow	2.0	0.9
44327110	N_N02	3	1.9	4.3		Hickory Hollow	2.0	1.9
44331000	Little Danceyard Creek	3	0.9	3.8	7.9	Niangua River	64.6	0.2
44332000	Danceyard Creek	3	4.7	8.2	8.9	Niangua River	65.0	4.2
44334000	Bennett Spring Branch	4	12.2	15.8	37.7	Niangua River	65.9	10.6
44334200	Woodward Hollow	3	3.5	7.0	9.2	Bennett Spring Branch	2.3	3.5
44334210	N_N03	3	2.7	3.7		Woodward Hollow	3.5	2.7
44334300	Dogwood Hollow	3	1.0	3.7		Bennett Spring Branch	9.2	0.0
44334310	N_N04	3	1.4	4.1		Bennett Spring Branch	12.2	1.4
44334100	Bennett Spring Branch	3	2.1	4.5		Bennett Spring Branch	0.0	2.1
44339000	Cat Hollow	3	1.5	4.1		Niangua River	68.9	1.5
44336000	Cave Creek	3	2.3	8.6	13.3	Niangua River	75.1	0.3
44337000	Fourmile Creek	4	3.5	10.0	25.3	Niangua River	78.8	0.0
44337000	Fourmile Creek	3	3.4	6.4		Fourmile Creek	0.0	1.7
44337100	Bell Fork	3	1.7	2.7		Fourmile Creek	3.5	1.7

44338000	Indian Creek	3	3.4	5.4	7.4	Niangua River	81.3	3.4
44341000	Benton Branch	3	0.4	3.6		Niangua River	84.8	0.4
44342000	Durington Creek	4	1.7	5.6	9.2	Niangua River	86.6	0.0
44342000	Durington Creek	3	0.5	3.8		Durington Creek	0.0	0.0
44342100	N_N05	3	1.0	2.4		Durington Creek	1.7	0.0
44343000	Raccoon Branch	3	1.4	2.6		Niangua River	89.7	0.0
44344000	Greasy Creek	4	14.8	21.8	71.2	Niangua River	91.4	0.0
44344100	N_N06	3	0.4	2.3		Greasy Creek	6.2	0.0
44344200	Opossum Creek	3	3.7	6.2		Greasy Creek	6.3	0.0
44344300	Buffalo Branch	3	1.4	3.1		Greasy Creek	11.3	0.0
44344400	Hankens Branch	3	1.9	4.7		Greasy Creek	12.0	0.0
44344500	Staten Creek	3	2.8	5.4		Greasy Creek	14.8	0.0
44344000	Greasy Creek	3	5.5	6.7		Greasy Creek	0.0	1.3
44346000	Sugartree Hollow	3	1.0	3.3		Niangua River	94.5	0.0
44347000	Dousinbury Creek	4	8.7	14.7	42.3	Niangua River	101.7	2.7
44347000	Dousinbury Creek	3	4.0	5.9		Dousinbury Creek	0.0	1.7
44347200	N_N07	3	4.3	5.3		Dousinbury Creek	8.7	0.0
44351000	Jones Branch	3	1.7	3.9		Niangua River	106.5	0.0
44351500	N-N15	3	0.4	1.6		Jones Branch	1.4	0.0
44352000	Gower Branch	3	0.3	3.6		Niangua River	110.7	0.0

44353000	Jones Creek	3	6.7	7.3		Jones Creek	0.0	2.7
44353100	Starvey Creek	3	7.1	7.9	13.3	Jones Creek	3.5	4.8
44358000	Patterson Branch	3	2.5	3.9		Niangua River	113.0	1.8
44354000	Hawk Pond Branch	3	3.2	4.5	5.8	Niangua River	115.9	0.0
44355000	Givins Branch	4	3.4	7.2	20.0	Niangua River	117.3	0.0
44355100	N_N08	3	1.2	3.8		Givins Branch	3.4	1.2
44355000	Givins Branch	3	2.6	3.8		Givins Branch	0.0	0.0
44357000	West Fork Niangua River	4	3.3	8.3	28.3	Niangua River	119.1	0.0
44357000	West Fork Niangua River	3	2.5	4.6		West Fork Niangua River	0.0	0.0
44357100	Greer Creek	4	1.4	4.9	9.7	West Fork Niangua River	3.3	0.0
44357100	Greer Creek	3	0.7	3.3		Greer Creek	0.0	0.0
44357110	N_N09	3	0.4	2.6		Greer Creek	1.4	0.0
44356000	East Fork Niangua River	4	1.5	9.9	25.1	Niangua River	119.1	0.0
44356000	East Fork Niangua River	3	5.2	8.3		East Fork Niangua River	0.0	0.0
44356100	Sarah Branch	3	2.4	3.8	5.0	East Fork Niangua River	1.5	0.0
44360000	Little Niangua River	5	43.6	60.8	320.4	Niangua River	5.7	0.0
44361100	Prairie Hollow	4	2.5	8.2	21.1	Little Niangua River	4.7	0.0
44361100	Prairie Hollow	3	3.5	5.7		Prairie Hollow	0.0	0.0

44361110	Osborne Hollow	3	1.8	4.8		Prairie Hollow	1.8	0.0
44361400	Fiery Fork	4	0.3	5.5	11.3	Little Niangua River	12.2	0.0
44361400	Fiery Fork	3	2.3	5.1		Fiery Fork	0.0	0.0
44361410	Toby Hollow	3	1.3	2.3		Fiery Fork	0.3	0.0
44361600	Kolb Branch	3	1.7	3.7		Little Niangua River	15.8	0.0
44361900	Bannister Hollow	3	2.7	4.9		Little Niangua River	17.5	0.0
44361900	Coffee Hollow	3	1.2	2.8		Little Niangua River	23.7	0.0
44361800	Macks Creek	4	8.1	11.4	36.7	Little Niangua River	24.2	0.0
44361820	Watsons Branch	3	0.8	3.2		Macks Creek	5.2	0.0
44361830	Brush Creek	3	0.4	4.0		Macks Creek	5.8	0.0
44361840	N_N10	3	0.2	2.0		Macks Creek	8.1	0.0
44361800	Macks Creek	3	3.1	3.1		Macks Creek	0.0	0.0
44362200	Starks Creek	4	4.1	15.2	36.0	Little Niangua River	29.8	0.0
44362200	Starks Creek	3	8.4	11.7		Starks Creek	0.0	0.0
44362210	N_N11	3	1.0	3.9		Starks Creek	4.1	1.0
44362300	N_N12	3	2.6	3.9		Little Niangua River	35.1	2.6
44362800	N_N13	3	0.5	2.0		Little Niangua River	37.4	0.5
44362500	Long Branch	3	1.8	4.9		Little Niangua River	40.1	1.8

44362600	Pippin Branch	3	2.6	4.1		Little Niangua River	42.0	2.6
44362700	Thomas Creek	5	0.9	10.9	43.4	Little Niangua River	43.6	0.0
44362710	Cahoochie Creek	4	4.7	9.1	20.1	Thomas Creek	0.9	0.0
44362710	Cahoochie Creek	3	1.6	5.1		Cahoochie Creek	0.0	0.0
44362711	N_N14	3	06	2.0		Cahoochie Creek	4.7	0.0
44362700	Thomas Creek	4	6.1	10.0	14.5	Thomas Creek	0.0	0.0
44362700	Thomas Creek	3	2.6	4.2		Thomas Creek	0.0	0.0
44362720	Monday Branch	3	0.7	3.3		Thomas Creek	7.0	0.7
44360000	Little Niangua River	4	5.0	17.3	101.3	Little Niangua River	0.0	0.0
44363400	Coatney Branch	3	1.4	3.3		Little Niangua River	48.2	0.0
44360000	Little Niangua River	3	9.2	12.2		Little Niangua River	0.0	0.0
44363500	Tunas Branch	3	0.8	3.9		Little Niangua River	48.6	0.9

Stream code - From stream classification system (Pflieger, 1981).

Length - Length in miles of segment of specific order.

Length to Headwater - Length in miles to origin.

Watershed Area - Square miles drained by listed streams watershed.

Stream mile - Distance from mouth of receiving stream to downstream end of described segment.

Length intermittent - Length of the segment shown as intermittent on topographic maps.