

**BIOLOGICAL BASELINE CONDITIONS  
IN THE  
LITTLE RIVER WATERSHED**

**Final Project Report**

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Nonpoint Source Implementation Grant**

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## **Executive Summary**

1. Eleven study sites were sampled on the Little River, two on Casey Creek, and three on Sinking Creek (Fig. 1). Physical and chemical data, algae, macroinvertebrates, and fish were collected, as well as a visual habitat assessment and a photograph.
2. Multi-metric scoring systems were used to integrate algae, macroinvertebrate, and fish metrics to identify streams impacted by point and nonpoint pollution sources (Table 0).
3. Biological, physicochemical, and habitat samples were collected at each site in July and September 2000, and data were compared between the two months. In July, 185 diatom taxa, 30 fish taxa, and 162 macroinvertebrate taxa were identified. In September 203 diatom taxa, 55 fish taxa, and 173 macroinvertebrate taxa were identified.
4. Casey Creek and the upper most study site on Sinking Fork Creek showed the best overall water quality. Casey Creek (CRR200015) was rated as a good in every category except macroinvertebrates. The most upstream site on Sinking Fork (CRR200010) also had a good rating in all categories except diatoms. No site scored a rating of good or excellent in every metric category (i.e., habitat, fish, macroinvertebrates, and diatoms).
5. Twelve of the sixteen sites had biotic index scores of poor or very poor. Four of these sites, on the North Fork of Little River, had poor/very poor scores in July and September (CRR200004, CRR200005, CRR200007, CRR200008) and two reaches on Sinking Fork (CRR200011 and CRR200016) also had ratings of poor or very poor in both sampling months. Several of the sites had very deep pools making them difficult to sample using an electroshocker. While IBIs were calculated for all fish collections, the following sites were deemed as having the most reliable IBI values: CRR200001, CRR200002, CRR200010 (10/10/00), CRR200011, CRR200014 (7/18/00), and CRR2000 (7/26/00).
6. Macroinvertebrates and fish generally showed a positive response to habitat quality. As quality increased, macroinvertebrate and fish scores tended to increase. This was not true for the Diatom Bioassessment Index (DBI). In fact,

only once did diatoms indicate “poor” or “very poor” water quality when fish, macroinvertebrates, or habitat was rated as poor for the same sample. Possibly, the DBI being used is not as sensitive to habitat impacts and nutrient enrichment that are occurring within the Little River Basin.

7. The most common disturbances to the streams in the Little River Basin were lack of habitat for aquatic organisms, deep, eroded, channelized streambeds, limited riparian area, and runoff from agricultural fields.
8. Only one stream in the City of Hopkinsville (CRR200008), on the North Fork of Little River, had very high nutrient levels, indicating sewage inputs from a wastewater treatment plant (CRR, unpublished data).
9. Overall similarities were found between this study compared with a study conducted by the Kentucky Division of Water (KDOW) in 1988 in the Little River and its tributaries. The KDOW found that the most impacted sites were on the North Fork of Little River, near Hopkinsville, as a result of wastewater treatment plants. Our data varied from these results because we found only one site on the North Fork indicating sewage (CRR200008). Casey Creek, Sinking Fork Creek, and the upper-most sites on the North Fork of Little River had the best biotic metric scores in both studies.
10. KDOW (1996) found more stream reaches impacted by point source pollution (i.e., sewage) than were found in this study. KDOW (1996) reported that Casey Creek, and two sites on the North Fork of Little River did not show elevated nitrogen-nitrate levels ( $\text{NO}_3\text{-N}$ ) for either of the sampling dates in 1996. Nutrient analysis showed the same North Fork site had low nitrogen-nitrate (< 3.0 mg/l) again in July 2000; however Casey Creek sites had high nitrogen-nitrate in July 2000 (CRR, unpublished data). Sinking Fork sites that had high nutrient levels in 1988 were low in 2000.
11. Most of the study sites on Little River showed signs of siltation, bank erosion, and elevated nitrogen levels (CRR, unpublished data). Nonpoint source pollutants from agricultural fields are degrading the stream water quality and threatening aquatic biota.

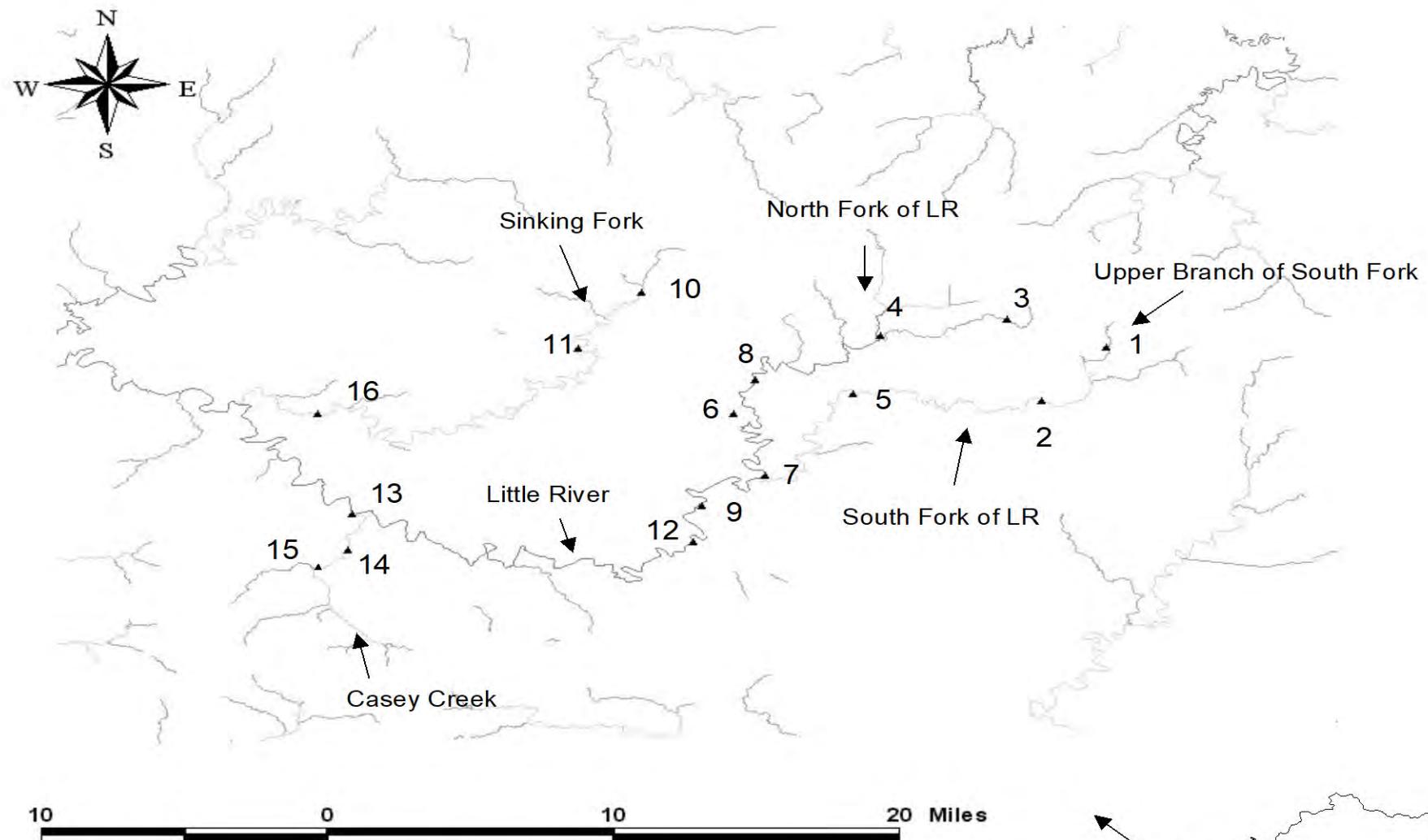


Figure 1. Study reaches in the Little River Basin. Sites are numbered from farthest upstream to downstream sites. Station codes are CRR200001 (1), CRR200002 (2), ...CRR20011(11), etc...

Table 0. Multi-metric scoring systems were used to integrate algae, macroinvertebrate, and fish metrics to identify streams impacted by point and nonpoint pollution sources.

Habitat Support Criteria for Habitat Assessment Values for sites in the Little River Basin and its Tributaries

<b>Metric Score</b>	<b>Classification</b>
≥122	Fully Supporting
121-110	Partially Supporting
<110	Not Supporting

Diatom Biotic Index Classification Criteria for Sites in the Little River Basin and its Tributaries

<b>Metric Score</b>	<b>Classification</b>
5	Excellent
4	Good
3	Fair
2	Poor
1	Very Poor

Macroinvertebrate Biotic Index Classification Criteria for Sites in the Little River Basin and its Tributaries

<b>Metric Score</b>	<b>Classification</b>
≥ 93	Excellent
68-92	Good
50-67	Fair
39-50	Poor
≤38	Very Poor

Fish Scoring Criteria for Index of Biotic Integrity in the Little River Basin and its Tributaries

<b>Metric Score</b>	<b>Classification</b>
57-60	Excellent
48-52	Good
39-44	Fair
28-35	Poor
<23	Very Poor

## **Introduction**

This study was conducted by the Center for Reservoir Research (CRR, Murray State University) in agreement with the Kentucky Division of Water (KDOW). The agreement laid the basis for the implementation of the Kentucky Nonpoint Source Management Program, as required by Section 319 of the Federal Clean Water Act Amendments of 1987. The main objectives were stated in the above agreement. They included

- (1) comparing resulting fish, macroinvertebrate, and algal data using biological metric criteria provided by KDOW for the Little River and its tributaries,
- (2) identifying biological indicators that are sensitive to, and/or specific for, nonpoint source pollution, and
- (3) comparing July and September biological data collected from the Little River sites and comparing these data with previous KDOW survey at the same sites.

The goal was to assess and identify streams in western Kentucky impacted by nonpoint source (e.g., runoff from fields, impermeable urban surfaces) pollution. Algae, fish, and macroinvertebrates were collected and identified to assess the biological integrity of each stream. Habitat assessments were conducted to supplement biological data. The protocols used for collection and metrics were established and detailed by the KDOW in "Methods for Assessing Biological Integrity of Surface Water" (1993). The KDOW methods were modified from those developed by the United States Environmental Protection Agency (US EPA) found in "Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers" (US EPA, 1999). Reference data collected from the least disturbed streams in the region were used as a foundation in which to compare our data.

## **Site Selection**

The general area of each site was pre-selected by personnel at KY Division of Water and was approximately at the same locations as in a previous KDOW investigation (KDOW 1996). The land uses indicated the potential for nonpoint source pollution, predominantly from agriculture fields (corn, soybeans, cattle). Detailed maps (7.5 minute USGS Topographical Maps) were used to locate the sampling sites. Locations were recorded using a Global Positioning System (Trimble Navigator Pro X R GPS unit) and entered into a Geographic Information System (GIS, Figure 1).

A total of 16 sites were sampled within the Little River or its tributaries in the Lower Cumberland River basin. Four sites were located on Casey Creek, three on Sinking Fork Creek, and the rest are on the Little River. All sites were sampled in July, during high base flow, and again in September 2000, during low base flow. May and June 2000 were months of extremely high precipitation, thus most spring sampling had to be postponed until July. In some cases, fish were not collected due to high water. One site (CRR200001) dried in September, so it was not possible to sample a second time.

## **Ecoregions**

All sites within the Little River basin are in the Interior Plateau ecoregion (Fig. 2). The Interior Plateau ecoregion is the largest region in western Kentucky with the most complete reference data for biological assessments. The geology consists of limestone, sand stone, and shale. Because of the solubility of limestone, many springs, caves, and sinks are present (McGrain, 1983). The plentiful springs produce a more

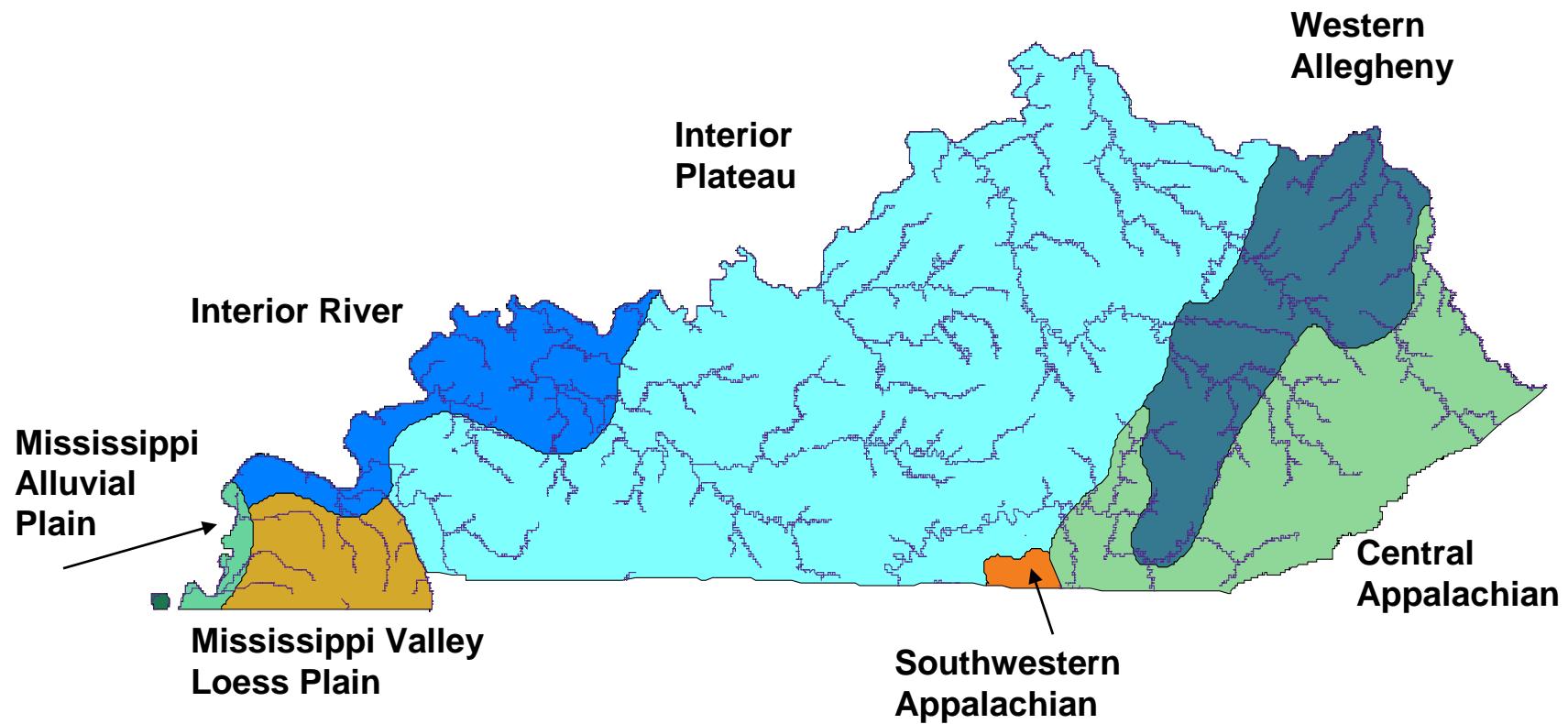


Figure 2: Ecoregions of Kentucky. Our study sites were located within the far western portion of the Interior Plateau ecoregion.

constant base flow throughout the year; surface water temperatures in the summer tend to be cooler, and the high alkalinites are reflected in potentially higher biological productivity. The stream substrates are normally dominated by gravel, sand, bedrock, and silt; however, we found much variability in substrate from one study site to the next. The land use is mostly for row cropping (corn, soybeans) and pasture/grazing. Very little riparian corridor is left in the Little River Drainage (KY GAP, 2001).

## **Materials and Methods**

Physicochemical measurements were recorded, algae and macroinvertebrates collected, and the habitat was assessed on the same day. Fish were sampled independently but as close to the other sampling event as possible.

**Physicochemical.** Physicochemical measurements were recorded at each site. A YSI 6820 Multi-Parameter Water Quality Monitor was used to measure dissolved oxygen, turbidity, pH, temperature, specific conductivity, and oxidation-reduction potential. Alkalinity was titrated in the field using 0.1985N H<sub>2</sub>SO<sub>4</sub> and is reported as mg CaCO<sub>3</sub> L<sup>-1</sup>. The stream channel cross-sections were divided into at least four smaller cross-sections, and water velocity was measured at 0.6 of the depth in each section using a Marsh McBirney 201 D PWCM flow meter. Discharge was calculated using the following equation: Q = WDU for each cross section of stream where

Q = stream discharge (m<sup>3</sup>/sec);

W = width of cross section (m);

D = average depth of cross section (m);

U = velocity (m/sec).

A roughness factor of 0.9 was multiplied with Q to account for friction from a rocky-bottomed substrate. All cross sections were summed for total discharge.

**Habitat Assessment.** Stream habitat and the riparian area for aquatic organisms were visually assessed at each site. The assessment protocol followed the US EPA's "Rapid Bioassessment Protocols (RBP) for Use in Wadeable Streams and Rivers" (1999). The datasheets are found on pages A-7 through A10. Both high and low gradient protocols were used in this study, depending on the stream flow. Table 1 shows the gradient scoring sheet used for each site and a list of habitat parameters evaluated. Each parameter is described in detail on pages 5-10 through 5-30 of the US EPA's RBP (EPA 1999).

Table 1: Habitat assessment variables.

<b>Parameters</b>	<b>Gradient</b>
1. Epifaunal Substrate/Available Cover	High and Low
2a. Embeddedness	High
2b. Pool Substrate Characterization	Low
3a. Velocity/Depth Combinations	High
3b. Pool Variability	Low
4. Sediment Depostion	High and Low
5. Channel Flow Status	High and Low
6. Channel Alteration	High and Low
7a. Frequency of Riffles	High
7b. Channel Sinuosity	Low
8. Bank Stability	High and Low
9. Bank Vegetative Protection	High and Low
10. Riparian Vegetative Zone Width	High and Low

A Nonpoint Source data sheet, provided by KDOW, was used as a supplemental reference for habitat quality, surrounding land use, weather conditions at the time of sampling, percentage substrate components, and other instream features similar to the above assessment form.

## **Biological Assessment**

**Algae.** Composite, qualitative algal samples were collected at all sites. Standard collection and identification methods are described in “Algal and Habitat Assessments for Reference Reach Stations” (KDOW, 1998). All sampling occurred on natural substrate when stream flow was normal to low. Algae were sampled with a microspatula for scraping substrates and a turkey baster for sucking material from substrates. All major habitat types were sampled including riffles, pools, and runs. Algae were placed in a 60 ml Nalgene™ bottle, preserved in 2% glutaraldehyde and refrigerated until processed.

The non-diatom algae were removed from the sample, mounted on pre-cleaned microscope slides, identified to the lowest possible level, and counted. Diatom frustules were cleared of organic and intercellular material using the Burn-Mount Method (Van Der Werff 1995). This method requires placing about 5-10 ml of sample in a 1,000 ml beaker and oxidizing the solution with 100 ml of 30% peroxide ( $H_2O_2$ ) for 24 hours. A microspatula of potassium dichromate ( $K_2Cr_2O$ ) is then added to the mixture causing a violent exothermic reaction that oxidizes all organic matter in 5 to 10 minutes leaving only the diatom frustules. The mixture was allowed to stand for 4 hours, decanted, filled with distilled water and left to stand again. The decanting process was repeated at least four times. The remaining diatoms were mounted in Hydrax or Nephrax on a precleaned slide, identified, and enumerated. A minimum of 3 slides was created for each sample. At least 600 valves and 10 valves of 10 species were observed for each diatom sample and/or 100 new species had not been observed consecutively (USEPA 1999). Slides and bench sheets are archived at Hancock Biological Station.

KDOW used streams that were shown to be the most representative and least disturbed as reference reaches to determine the most pollutant sensitive metrics for each ecoregion (Table 2). The four metrics specific to the diatoms were scored and the scores were averaged, giving the Diatom Biotic Index value (DBI). The DBI scoring classification table can be found in Appendix A. The two non-diatom algal metrics give further insight into the quality of the stream. Each metric is described in detail by the “Algal and Habitat Assessments For Reference Reach Stations” (KDOW, 1995, pg. 120).

Table 2: Algae Metrics Used to Calculate the Diatom Bioassessment Index (DBI) and Non-diatom Scores.

<b>Algae Metrics</b>	
Non-diatom metrics:	Total Number of Non-diatom Divisions Present Total Number of Non-diatom Algal Taxa
Diatom Metrics:	Total Number Of Diatom Taxa Diatom Diversity %Sensitive Species Pollution Tolerance Index Diatom Bioassessment Index

(Algal and Habitat Assessments For Reference Reach Stations, KDOW, 1995, pg. 120).

**Macroinvertebrates.** Benthic macroinvertebrates were sampled using two collection methods that varied with stream morphology. All streams with riffles were sampled with a one-meter kick-net in the riffles, and with a D-frame net in the remainder of habitats (undercut banks, woody debris, vegetation, etc). This Multi-habitat sampling method is semi-quantitative (KDOW 1993). In streams where riffles were a significant feature, 2 half-meter kick net samples were taken in the riffle areas, as well as sampling the remainder of the habitat. Available habitat was weighed on a percentage basis, so all sites received comparable sampling effort.

The second sampling type was specific to low gradient, slow flowing, sandy-gravelly bottomed streams. This method, referred to as the Mid-Atlantic Coastal Plain Sampling Method (MACS), was developed by several southeastern states and summarized in the USEPA RBP (1999) and has recently been adopted by KDOW for use in the Coastal Plain area. It is a semi-quantitative, multi-habitat sampling method using a D-frame net. Approximately 20 one-meter sweeps of all the major habitats are collected based on the percent habitat available.

The macroinvertebrate metrics (Table 3) were devised by the KDOW and were based on the most sensitive pollution indicators. The metric scores were based on analyses of data from all streams sampled, both reference and impacted (our data and DOW's), in the Interior Plateau ecoregion.

Table 3: Macroinvertebrate metrics used to calculate the Macroinvertebrate Bioassessment Index (MBI).

<b>Metrics</b>
Total Number of Genera
Total Number of Ephemeroptera, Plecoptera, and Trichoptera Genera
Hilsenhoff Biotic Index
% Ephemeroptera Plecoptera and Trichoptera
% Chironomidae (Diptera)
% 5 Dominant Taxa

All of the metric scores are based on a 95% percentile calculated for each metric by compiling reference and study site data (Greg Pond, Ecological Support, KDOW). The actual values of each metric were divided by the calculated 95<sup>th</sup> percentile and multiplied by 100, ranking all streams together, including the reference data, so that comparisons could be made among similar streams (USEPA, 1999) and so that outliers would not adversely effect study site scores. The Macroinvertebrate Bioassessment Index (MBI) is the average of the 6 metric scores. The scoring classification (Greg Pond, Ecological Support, KDOW) separated the data under the 95<sup>th</sup> percentile into

quarters (in most cases) and values were assigned (Table 0). A scoring table is located at the beginning of the text. For a complete explanation employing the use of the 95<sup>th</sup> percentile refer to the USEPA's RBP manual (1999) or DeShon (1995). Greg Pond, Ecological Support Section of KDOW, provided an analysis of the data.

**Fish.** Fish were sampled at each site using a portable backpack electroshocker. A selected 100-meter reach was sampled intensively shocked approximately 60 minutes. Fish samples were preserved in the field using 10% CaCO<sub>3</sub> buffered formalin. Large specimens were identified in the field, recorded, and released. Small, easily identifiable fish captured in abundance also were recorded and released. Fish samples were taken back to the laboratory, allowed to fix in the formalin, rinsed with water, and preserved in 70% ethanol. Specimens were identified, enumerated, and recorded.

The Index of Biotic Integrity (IBI, Karr 1981) uses equally weighted metrics to detect impacted fish populations (Table 4). Different metrics were used for different ecoregions, as determined by KDOW's analyses of reference data. In order to compare our study data with the reference data, the 95<sup>th</sup> percentile for all reference data within each ecoregion was calculated. This method normalizes the data so that sites with particularly high values are not weighted as heavily. Unusually high values could cause the remaining study sites to be rated too low. Only data under the 95<sup>th</sup> percentile were used as a means of comparison, yielding expected values. If a metric value was close to the calculated expected value then a score of 5 was assigned, a 3 was given if the study metric deviated from the expected, and 1 if the study metric score was far from the expected value calculated in the reference streams. These values were

summed with a total of 60 being possible and then ranked according to their support of a healthy fish population.

KDOW provided us with the appropriate graphs having the 95<sup>th</sup> percentile and trisected areas already calculated. Many of the fish metrics varied with the drainage size of the stream, which was also accounted for in the graphs. A more detailed description of the data analyses can be found in the "Reference Reach Fish Community Report", KDOW, 1997).

**Table 4: Metrics Used to Calculate Fish Index Of Biotic Integrity**

Ecoregion	Metrics
<b>IP: Headwaters:</b>	Total Number of Species varies with Drainage Area Number of Darter and Sculpin species varies with Drainage Area Number of Intolerant Species varies with Drainage Area Number of Headwater Species Number of Minnow Species % Tolerant Species % Omnivores % Insectivorous Species varies with Drainage Area % Pioneer Species % Simple Lithophilic Spawners varies with Drainage Area % Deformities, Eroded Fins, Lesions, and Tumors (DELT). Total Number of Individuals
<b>IP: Wadeable:</b>	Total Number of Species varies with Drainage Area Number of Darter Species varies with Drainage Area Number of Sunfish Species Number of Sucker Species Number of Intolerant Species varies with Drainage Area Percent Tolerant Species Number of Omnivores Number of Insectivorous Species varies with Drainage Area Number of Top Carnivores Number of Simple Lithophilic Spawners varies with Drainage Area Total Number of Individuals % Deformities, Eroded Fins, Lesions, and Tumors (DELT). Total Number of Individuals

(Fish metrics assemblages are from " Reference Reach Fish Community Report, DOW 1997).

**Data Storage.** Biological and habitat data were entered into the state's Ecological Database System (EDAS), and will be returned to the state for distribution to all

participating organizations). Original specimens, slides, datasheets, and bench sheets are archived at the Hancock Biological Station, Murray State University.

## Results

**Habitat Assessment.** The overall average habitat assessment score was  $117.32 \pm 12.06$ , ranging from 96 to 147 (Table 5). Five sites were classified as fully supporting aquatic organisms: North Fork of the Little River (CRR200006), both sites on Casey Creek (CRR200014 and CRR200015), and two sites on Sinking Fork Creek (CRR200010 and CRR200016). Four sites were classified as non-supporting: three sites on the North Fork of Little River, directly downstream from Hopkinsville, and one site on the South Fork of Little River, northwest of Hopkinsville (Table 6). In most cases, low habitat assessment scores were the result of channelized streambeds, unstable banks, little vegetative protection, and a limited riparian corridor.

Habitat quality did not vary between the two sampling dates for most sites. Our original sampling site at Casey Creek (CRR200015) was dry in September and consequently we sampled approximately 100 meters downstream. The second site was much different, with the top of the reach being a large cave with a spring that serves as the water source for Casey Creek during dry periods. We sampled above and below a beaver dam at this site.

Stream discharge was normally higher in the spring and water temperatures were colder in late summer, and turbidity was variable, depending on proximity to rain events (Fig. 3, Table 6).

Table 5: Habitat assessment values for study sites in the Little River Drainage Basin (Interior Plateau Ecoregion). Sites that changed between the Spring and Fall samples, due to a change in stream flow, are represented by two assessments on the respective dates. PS = Partially Supporting aquatic organisms, FS = Fully Supporting, and NS = Not Supporting

<b>Station Code</b>	<b>Stream Name</b>	<b>Stream Gradient</b>	<b>Date</b>	1	2	3	4	5	6	7	8	9	10	11	12	13	Totals	Use-Support
CRR200001	South Fork	Low	7/06/00	10	10	13	11	9	14	12	6	4	7	6	7	2	111	PS
CRR200002	South Fork	Low	7/13/00	12	11	13	14	14	13	9	3	4	5	6	1	1	106	NS
CRR200003	Lower Branch of LR	Low	7/07/00	11	8	13	11	14	15	13	5	6	7	5	7	2	117	PS
CRR200004	Upper Branch of LR	Low	7/06/00	8	8	13	13	19	13	12	5	6	6	7	1	1	112	PS
CRR200005	North Fork	Low	7/03/00	12	14	12	18	18	13	9	5	4	5	4	3	2	107	NS
CRR200006	North Fork	Low	7/05/00	10	13	13	16	18	18	9	3	3	5	5	5	5	123	FS
CRR200007	North Fork	Low	7/05/00	8	7	11	16	18	13	7	3	3	5	5	5	5	106	NS
CRR200008	North Fork	Low	7/03/00	13	8	13	8	15	13	6	3	3	5	5	2	2	96	NS
CRR20000	Little River	High	6/29/00	14	7	18	13	15	13	7	7	5	8	8	3	4	122	PS
CRR200010	Sinking Fork	Low	7/07/00	14	13	18	13	10	14	10	7	7	7	8	1	3	125	FS
CRR200011	Sinking Fork	Low	7/07/00	12	12	11	13	15	13	8	7	6	7	7	4	4	119	PS
CRR20001	Little River	High	7/12/00	15	18	17	15	15	13	11	7	7	9	7	10	3	147	FS
CRR200013	Little River	Low	7/12/00	11	11	13	18	18	13	5	8	5	5	5	3	3	118	PS
CRR20001	Casey Creek	High	6/26/00	9	20	13	8	10	14	10	5	7	7	7	4	5	119	PS
CRR20001	Casey Creek	High	9/05/00	12	19	13	8	8	15	12	5	6	8	8	4	7	125	FS
CRR200015	Casey Creek	Low	6/29/00	11	11	17	10	7	16	10	3	6	7	8	4	5	115	PS
CRR200015	Casey Creek	Low	9/08/00	13	11	13	17	15	15	7	13	6	6	7	9	9	141	FS
CRR20001	Sinking Fork	High	6/26/00	12	16	17	8	10	13	13	3	3	6	6	7	1	115	FS

#### High Gradient Streams

- 1 = Bottom Substrate/Available Cover
- 2 = Embeddedness
- 3 = Velocity/Depth Regime
- 4 = Sediment Deposition
- 5 = Channel Flow Status
- 6 = Channel Alteration
- 7 = Frequency of Riffles
- 8 = Bank Stability – Left Bank
- 9 = Bank Stability – Right Bank
- 10 = Vegetative Protection – Left Bank
- 11 = Vegetative Protection – Right Bank
- 12 = Riparian Width – Left Bank
- 13 = Riparian Width – Right Bank

#### Low Gradient Streams

- 1 = Bottom Substrate/Available Cover
- 2 = Pool Substrate Characterization
- 3 = Pool variability
- 4 = Sediment Deposition
- 5 = Channel Flow Status
- 6 = Channel Alteration
- 7 = Channel Sinuosity
- 8 = Bank Stability – Left Bank
- 9 = Bank Stability – Right Bank
- 10 = Vegetative Protection – Left Bank
- 11 = Vegetative Protection – Right Bank
- 12 = Riparian Width – Left Bank
- 13 = Riparian Width – Right Bank

Table 6: Field physicochemical data collected from sites in the Little River Drainage Basin.

Station Code	Stream Name	Date	Temp (°C)	D.O. (mg/l)	pH	Turb (NTU)	Cond (mS/cm)	Orp (MV)	Channel Width(m)	Alkalinity (mg CaCO <sub>3</sub> /l)	Discharge (m <sup>3</sup> /sec)
CRR2000001	South Fork	7/06/00	22.35	10.19	7.37	13.50	410.00	237.30	7.50	29.66	0.029
CRR2000002	South Fork	7/03/00	21.32	8.25	7.54	38.30	395.00	190.90	8.90	23.86	0.000
CRR2000002	South Fork	9/14/00	19.82	7.21	7.44	5.80	431.00	264.20	8.50	33.03	0.039
CRR2000003	Lower Branch NF	7/07/00	25.78	7.58	7.76	8.30	321.00	257.40	5.90	32.18	0.016
CRR2000003	Lower Branch NF	12/08/00	3.39	11.68	7.90	6.00	331.00	267.70	3.50	33.46	0.012
CRR2000004	Upper Branch NF	7/06/00	23.19	7.95	7.41	5.00	225.00	228.20	4.80	28.53	0.149
CRR2000004	Upper Branch NF	9/14/00	22.78	3.92	7.37	32.00	178.00	206.10	5.50	25.76	0.126
CRR2000005	South Fork	7/03/00	23.26	9.74	7.77	10.40	424.00	244.40	10.50	30.55	0.022
CRR2000005	South Fork	9/07/00	22.35	7.20	7.73	11.20	459.00	220.50	9.40	27.56	0.172
CRR2000006	North Fork	7/05/00	24.01	8.26	7.64	3.40	525.00	217.80	8.40	27.23	0.161
CRR2000006	North Fork	9/15/00	20.51	6.12	7.50	21.70	379.00	262.10	9.40	32.76	0.173
CRR2000007	North Fork	7/05/00	24.54	6.76	7.66	17.30	599.00	169.40	12.45	21.18	0.312
CRR2000007	North Fork	9/15/00	22.33	7.06	7.65	16.00	559.00	228.10	11.90	28.51	0.125
CRR2000008	North Fork	7/03/00	24.13	9.62	7.56	6.20	531.00	228.60	6.90	28.58	0.073
CRR2000008	North Fork	9/07/00	22.08	4.50	7.36	3.10	514.00	226.10	11.50	28.26	0.180
CRR2000009	Little River	6/29/00	21.86	8.49	7.67	12.50	498.00	224.70	17.40	28.09	0.488
CRR2000009	Little River	9/16/00	21.78	6.99	7.66	9.60	510.00	222.10	18.00	27.76	1.033
CRR2000010	Sinking Fork	7/07/00	22.60	9.84	7.66	8.30	368.00	226.50	8.30	28.31	0.000
CRR2000010	Sinking Fork	9/14/00	19.86	5.18	7.69	3.10	389.00	233.30	9.00	29.16	0.014
CRR2000011	Sinking Fork	7/07/00	16.52	11.46	8.00	2.90	361.00	221.60	10.80	27.70	0.036
CRR2000011	Sinking Fork	9/07/00	21.38	5.23	7.69	7.40	375.00	250.50	11.70	31.31	0.017
CRR2000012	Little River	7/12/00	22.63	8.81	7.47	11.10	458.00	275.40	19.60	34.43	0.892
CRR2000012	Little River	9/16/00	20.28	9.00	7.57	6.00	499.00	257.00	22.00	32.13	0.365
CRR2000013	Little River	7/12/00	23.97	12.06	7.92	10.40	403.00	248.70	20.40	31.09	1.909
CRR2000013	Little River	9/08/00	22.93	6.62	7.80	11.80	422.00	232.80	20.60	29.10	0.494
CRR2000014	Casey Creek	6/26/00	16.33	12.24	7.61	3.50	286.00	261.80	7.18	32.73	0.420
CRR2000014	Casey Creek	9/05/00	19.33	7.89	7.66	3.90	390.00	244.60	8.00	30.58	0.057
CRR2000015	Casey Creek	6/29/00	14.61	6.20	7.00	5.90	330.00	273.00	4.90	34.13	0.000
CRR2000015	Casey Creek	9/08/00	13.47	8.01	7.05	12.01	364.00	254.30	8.00	31.79	0.214
CRR2000016	Sinking Fork	6/26/00	20.75	10.80	7.67	11.60	324.00	246.80	10.15	30.85	1.838
CRR2000016	Sinking Fork	9/08/00	20.15	7.11	7.77	6.10	405.00	239.40	6.50	29.93	0.094

### Little River Basin Stream Discharge

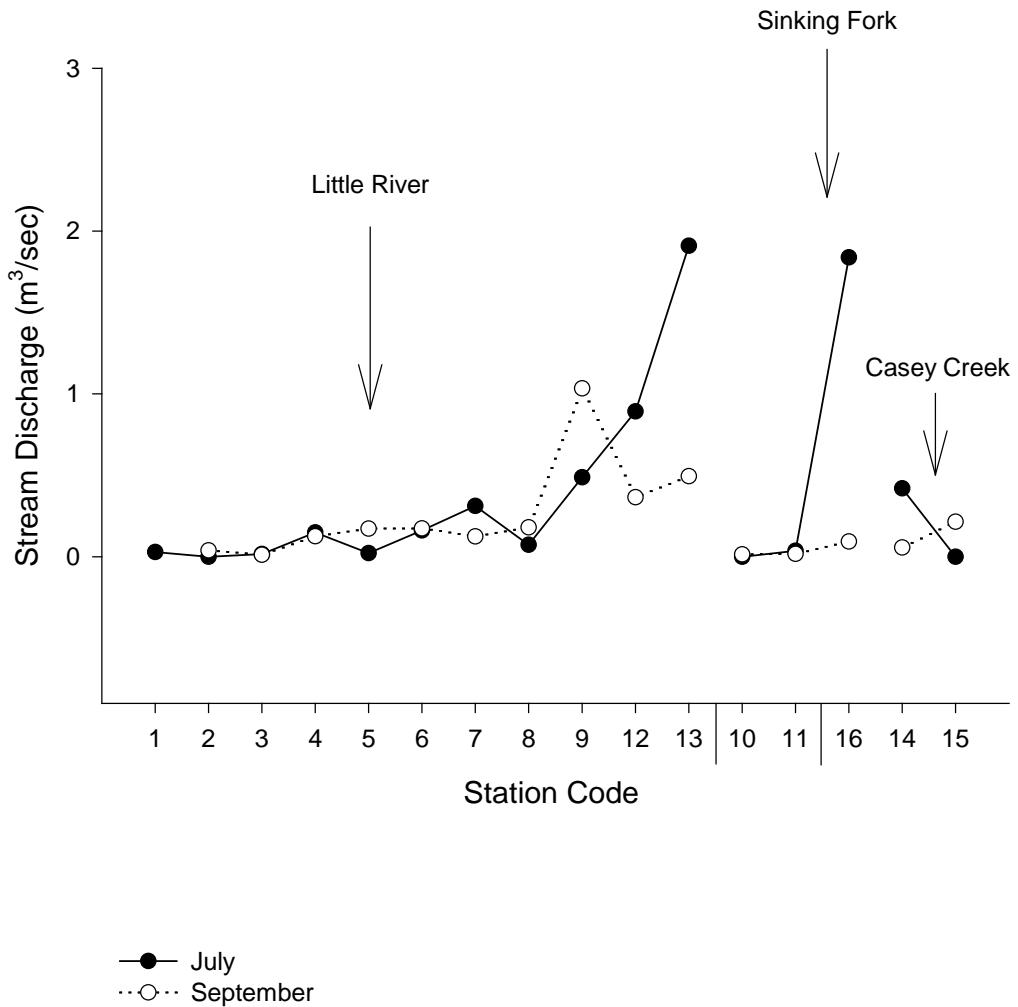


Figure 3. Stream discharge for study reaches in Little River, Sinking Fork, and Casey Creeks. Sites were numbered and ordered in a downstream direction. Station codes are CRR2000 plus the site number, CRR200001...CRR200016.

**Algae.** One hundred and eighty-five algae taxa were collected in July and 203 algae taxa were collected in September. July samples were dominated by four pollution tolerant diatom species: *Achnanthidium minutissimum* (= *Achnanthes minutissimum*), *Amphora perpusilla*, *Navicula minima*, *Nitzschia dissipata*, and a blue-green alga, *Schizothrix calicola*. The dominant species in September were *Achnanthidium minutissimum*, *Gomphonema parvulum*, *Navicula minima*, *Nitzschia amphibia*, and *Schizothrix calicola*.

The overall mean number of diatom species collected for all sites was  $42.26 \pm 9.4$ , ranging from 26 to 58 species (Table 7). The DBI average was  $3.2 \pm 0.62$ , ranging from 2 to 4.5. DBI scores indicated that Casey Creek (CRR200012), Little River (CRR200012), and one site on the South Fork of Little River (CRR20005) rated as good to excellent. DBI values for each site and date were graphed against the habitat assessment values. A regression line was calculated to indicate the DBI expected value (Fig. 4). Many DBI values deviated from the habitat assessment values, inferring that something other than stream habitat was influencing the diatom community and diversity. Most sites that were rated as poor and very poor showed low species diversity in both the species diversity index (TNDT) and Shannon Index of Diversity ( $H'$ , DIV). All sites scored relatively high for the percentage Sensitive Species (%SS) and Pollution Tolerance Index (PTI, Table 7).

Few overall differences occurred between the spring and summer samples. Diatom species diversity was somewhat higher in September ( $45.66 \pm 8.25$ ) than in July ( $39.13 \pm 9.71$ ), and the DBIs were similar in July ( $3.23 \pm 0.64$ ) and September ( $3.33 \pm 0.060$ ).

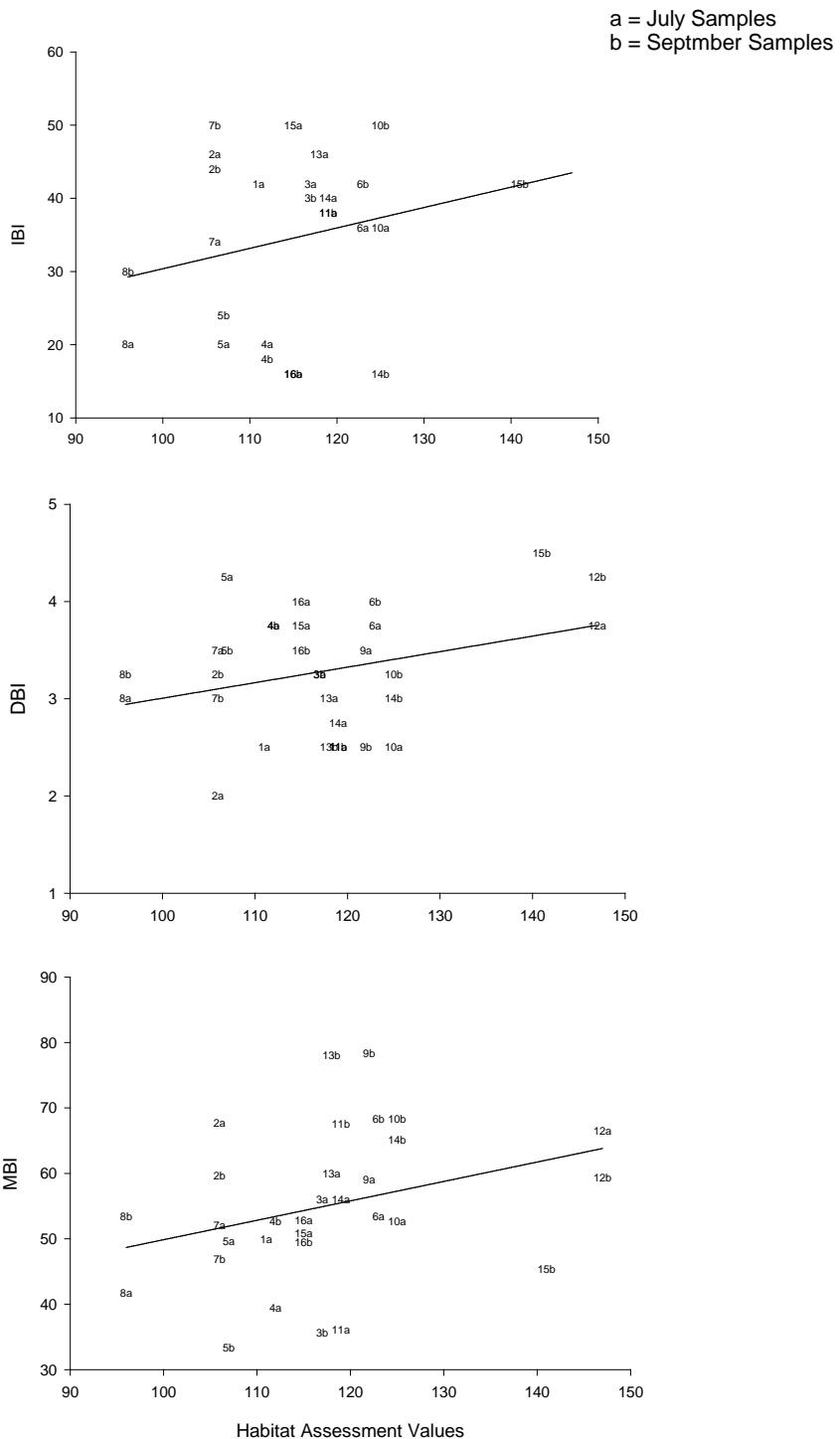


Figure 4. Biotic indices (IBI, DBI, and MBI) relating values to habitat quality.  
A regression line was calculated to show the deviation of the index scores from the habitat values.

Table 7: Diatom Bioassessment Index (DBI) and non-diatom algal scores for the Little River Basin (Interior Plateau Ecoregion).

<b>Station Code</b>	<b>Stream Name</b>	<b>Date</b>	<b>TNTD</b>	<b>S</b>	<b>DIV</b>	<b>S</b>	<b>%SS</b>	<b>S</b>	<b>PTI</b>	<b>S</b>	<b>DBI</b>	<b>TNNDV</b>	<b>S</b>	<b>TNDS</b>	<b>S</b>
CRR200001	South Fork	7/06/00	39	2	0.62	1	11.86	4	2.11	3	2.50	4	3	7	2
CRR200002	South Fork	7/03/00	40	2	0.71	1	4.25	3	1.95	2	2.00	3	2	5	1
CRR200002	South Fork	9/14/00	40	2	0.81	2	6.43	4	2.81	5	3.25	4	3	8	2
CRR200003	Lower Branch NF	7/07/00	58	4	0.88	2	5.76	3	2.77	4	3.25	3	2	10	2
CRR200003	Lower Branch NF	9/14/00	57	4	0.92	2	3.93	3	2.66	4	3.25	3	2	14	3
CRR200004	Upper Branch NF	7/06/00	45	3	1.34	3	41.01	5	2.42	4	3.75	3	2	3	1
CRR200004	Upper Branch NF	9/14/00	54	3	1.34	3	29.60	5	2.66	4	3.75	4	3	6	2
CRR200005	South Fork	7/03/00	54	3	1.47	5	66.42	5	2.72	4	4.25	2	1	3	1
CRR200005	South Fork	9/07/00	55	4	0.95	2	7.27	4	2.45	4	3.50	3	2	7	2
CRR200006	North Fork	7/05/00	47	3	1.34	5	30.73	5	1.93	2	3.75	3	2	4	1
CRR200006	North Fork	9/15/00	41	2	1.29	5	50.00	5	2.47	4	4.00	4	3	5	1
CRR200007	North Fork	7/05/00	36	2	1.16	4	27.16	5	2.09	3	3.50	2	1	2	1
CRR200007	North Fork	9/15/00	47	3	0.80	2	11.32	4	2.27	3	3.00	3	2	6	2
CRR200008	North Fork	7/03/00	49	3	0.66	1	14.92	4	2.49	4	3.00	3	2	7	2
CRR200008	North Fork	9/07/00	50	3	0.72	2	9.11	4	2.51	4	3.25	3	2	8	2
CRR200009	Little River	6/29/00	33	2	1.14	4	38.12	5	2.03	3	3.50	3	2	3	1
CRR200009	Little River	9/16/00	28	1	1.06	3	15.72	4	1.71	2	2.50	4	3	8	2
CRR200010	Sinking Fork	7/07/00	26	1	0.68	1	8.75	4	2.66	4	2.50	4	3	6	2
CRR200010	Sinking Fork	9/14/00	51	3	0.85	2	13.82	4	2.52	4	3.25	3	2	7	2
CRR200011	Sinking Fork	7/07/00	28	1	0.59	1	13.34	4	2.72	4	2.50	3	2	4	1
CRR200011	Sinking Fork	9/07/00	42	2	0.75	2	4.40	3	2.18	3	2.50	3	2	9	2
CRR200012	Little River	7/12/00	38	2	1.11	4	79.89	5	2.72	4	3.75	3	2	3	1
CRR200012	Little River	9/16/00	50	3	1.47	5	46.80	5	2.40	4	4.25	4	3	4	1
CRR200013	Little River	6/12/00	26	1	1.01	3	33.65	5	2.10	3	3.00	1	1	6	2
CRR200013	Little River	9/08/00	45	3	0.69	1	7.13	4	1.96	2	2.50	3	2	9	2
CRR200014	Casey Creek	6/26/00	43	3	0.79	2	2.94	3	2.02	3	2.75	3	2	4	1
CRR200014	Casey Creek	9/05/00	46	3	0.75	2	9.03	4	2.16	3	3.00	3	2	5	1
CRR200015	Casey Creek	6/29/00	30	2	1.24	4	48.79	5	2.77	4	3.75	3	2	8	2
CRR200015	Casey Creek	9/08/00	48	3	1.26	5	54.33	5	2.81	5	4.50	3	2	6	2
CRR200016	Sinking Fork	6/26/00	34	2	1.26	5	51.41	5	2.53	4	4.00	4	3	1	1
CRR200016	Sinking Fork	9/08/00	31	2	1.08	4	49.75	5	2.22	3	3.50	2	1	10	2

TNTD = Total number of diatom taxa.

S = Metric Score following each metric value (1-5 with 1 being poor and 5 being excellent).

Div. = Diatom diversity ( $H'$ )

%SS = Percent sensitive species (Diatoms)

PTI = Pollution tolerance index (Diatoms)

DBI = Diatom bioassessment index

TNNDV= Total number of non-diatom divisions present

TNDS = Total Number of Non-diatom Species



Non-diatom divisions and species did increase in September. Total numbers of non-diatom algal taxa were  $4.75 \pm 2.40$  in July and  $7.46 \pm 2.47$  in September. Non-diatom algal divisions were  $2.93 \pm 0.77$  in July and  $3.26 \pm 0.59$  in September. Non-diatom taxa richness averaged  $6 \pm 2.7$  taxa per site, ranging from 1 to 14 species.

**Macroinvertebrates.** One hundred and sixty-two taxa of aquatic insects, mollusks, decapods, amphipods, isopods, and oligochaetes were identified in the Little River system in July. Dominant taxa collected were all relatively sensitive to organic pollution: *Polypedilum*, *Elimia*, *Stenelmis*, *Dubiraphia*, and *Procladius* (Lenat 1993). Overall, taxa richness varied by as much as 30 genera per site. In September, 173 taxa were identified with the dominant taxa remaining the same, with the exception that the Chironomidae genus *Tanytarsus* was more dominant than *Procladius* (see Appendix B).

Overall macroinvertebrate genus richness was quite variable, with an average of  $34 \pm 11$  genera collected and with site values ranging from 13 to 55. The Macroinvertebrate Bioassessment Index (MBI) average was  $54.99 \pm 11.52$ , ranging from 33 to 78. MBI scores indicated that five Little River sites had good water quality (Table 8). These sites included the North Fork of Little River (CRR200006), two sites on Little River (CRR200009, CRR200013), and two sites on Sinking Fork Creek (CRR200010, CRR200011).

Table 8: Macroinvertebrate Biotic Index (MBI), overall quality rating, and metrics used to calculate MBI in the Little River Drainage Basin (Interior Plateau Ecoregion).

Station Code	Stream Name	Date	Genus	EPT		% Chiro	% 5 Dom	MBI	Rating	Use-Support	
			Taxa	Genus Taxa	HBI						
CRR200001	South Fork	7/6/00	92.59	16.67	53.58	5.19	68.00	92.59	49.98	Poor	NS
CRR200002	South Fork	7/3/00	66.67	38.89	72.80	89.27	93.52	66.67	67.69	Fair	PS
CRR200002	South Fork	9/14/00	77.78	33.33	66.60	23.60	91.30	77.78	59.62	Fair	PS
CRR200003	Lower Branch NF	7/7/00	85.19	22.22	54.92	9.92	71.95	85.19	55.97	Fair	PS
CRR200003	Lower Branch NF	12/8/00	57.41	5.56	42.52	0.37	63.15	57.41	35.65	Vpoor	NS
CRR200004	Upper Branch NF	7/6/00	66.67	11.11	56.06	6.56	30.24	66.67	39.37	Poor	NS
CRR200004	Upper Branch NF	9/14/00	96.30	22.22	59.28	11.84	34.84	96.30	52.69	Fair	PS
CRR200005	South Fork	7/3/00	55.56	11.11	80.82	23.89	79.07	47.08	49.59	Poor	NS
CRR200005	South Fork	9/7/00	24.07	0.00	61.84	0.00	102.35	24.07	33.37	Vpoor	NS
CRR200006	North Fork	7/7/00	57.41	27.78	80.80	27.19	76.35	57.41	53.38	Fair	PS
CRR200006	North Fork	9/15/00	59.26	38.89	78.78	62.66	91.97	59.26	68.36	Good	FS
CRR200007	North Fork	7/6/00	50.00	16.67	79.64	12.67	51.91	50.00	52.10	Fair	PS
CRR200007	North Fork	9/15/00	40.74	22.22	72.24	7.37	82.48	40.74	46.83	Poor	NS
CRR200008	North Fork	7/3/00	29.63	11.11	93.74	13.95	87.97	29.63	41.65	Poor	NS
CRR200008	North Fork	9/18/00	55.56	16.67	74.64	46.85	88.64	55.56	53.36	Fair	PS
CRR200009	Little River	6/29/00	37.04	27.78	84.52	81.58	68.64	37.04	59.00	Fair	PS
CRR200009	Little River	9/15/00	92.59	61.11	84.14	68.50	87.49	92.59	78.28	Good	FS
CRR200010	Sinking Fork	7/7/00	74.07	22.22	68.16	22.61	86.28	74.07	52.67	Fair	PS
CRR200010	Sinking Fork	9/14/00	101.85	44.44	82.92	87.74	62.22	101.85	68.25	Good	FS
CRR200011	Sinking Fork	7/7/00	50.00	16.67	59.42	6.72	78.60	42.65	36.03	Vpoor	NS
CRR200011	Sinking Fork	9/7/00	92.59	44.44	71.00	24.92	94.60	92.59	67.62	Good	FS
CRR200012	Little River	7/12/00	92.59	61.11	85.32	22.53	98.53	92.59	66.42	Fair	PS
CRR200012	Little River	9/22/00	51.85	50.00	89.66	21.05	101.77	51.85	59.41	Fair	PS
CRR200013	Little River	7/12/00	42.59	33.33	75.90	21.37	96.19	42.59	59.91	Fair	PS
CRR200013	Little River	9/8/00	79.63	61.11	85.48	52.87	91.18	79.63	78.08	Good	FS
CRR200014	Casey Creek	6/26/00	48.15	50.00	105.30	17.85	102.23	48.15	56.07	Fair	PS
CRR200014	Casey Creek	9/5/00	85.19	83.33	82.74	17.02	93.34	85.19	65.19	Fair	PS
CRR200015	Casey Creek	6/29/00	94.44	22.22	61.32	3.28	61.03	94.44	50.78	Fair	PS
CRR200015	Casey Creek	9/8/00	51.85	11.11	99.72	3.79	100.00	51.85	45.30	Poor	NS
CRR200016	Sinking Fork	6/26/00	44.44	38.89	96.82	11.55	102.16	44.44	52.81	Fair	PS
CRR200016	Sinking Fork	9/8/00	50.00	33.33	88.06	9.26	102.05	50.00	49.51	Poor	NS

Table 8 continued.

Genus Taxa = Total Number of Genera  
EPT Genus Taxa = Total Number of Ephemeroptera, Plecoptera, and Trichoptera Genera  
HBI = Hilsenhoff Biotic Index  
%EPT = % Ephemeroptera Plecoptera and Trichoptera  
%Chiro = %Chironomidae (Diptera)  
%5 Dom = % 5 Dominant Taxa  
MBI = Macroinvertebrate Bioassessment Index  
NS = Not Supporting of a healthy aquatic invertebrate community  
PS = Partially Supporting of a healthy aquatic invertebrate community  
FS = Fully Supporting of a healthy aquatic invertebrate community

Ten stream sites were classified as non-supporting, however, processing errors occurred at the following sites: South Fork of Little River (CRR20005, September), Little River (CRR200012, September), and Sinking Fork Creek (CRR200016, July) making the data difficult to interpret. One site on the South Fork of Little River (CRR20003, September) was re-collected in December.

Sites rated as poor or very poor were classified as non-supporting of aquatic organisms. Most of these sites were located on the North and South Forks of the Little River (Table 8). In every site rated as poor or very poor for macroinvertebrates, %EPT (% Ephemeroptera, Plecoptera, and Trichoptera), and number of EPT genera were very low. The absence of mayflies, stoneflies, and caddisflies was largely responsible for the low MBI values (Table 8).

In order to understand variables influencing the results of the MBI values, the habitat value was graphed with MBI scores, and a regression line was calculated to indicate the expected value (Fig. 4). Although the relationship was not statistically significant, the graph permits visualization of MBI scores that deviate from the expected habitat value. Many of the MBI values deviated from the expected value, indicating other variables such as siltation, habitat loss, and nutrient enrichment potentially

influenced the assemblage. MBI values were more closely related to physical habitat scores than the DBI and IBI.

Macroinvertebrate diversity and MBI scores varied little between July and September samples. Average taxa diversity in July was  $33 \pm 11$  and  $36 \pm 12$  in September. MBI scores were  $52.71 \pm 8.66$  in July and  $57.43 \pm 13.83$  in September.

**Fish.** Thirty fish taxa were collected in July, and 55 were collected in September. Long ear sunfish, blackspotted topminnows, and banded sculpin dominated July and September samples. An overall average of  $8 \pm 3$  fish species was identified with richness ranging from 1 to 17 species per stream reach. The average IBI score was  $34.46 \pm 11.7$ , ranging from 16 to 50 at the individual sites. The IBI scores in the headwater streams showed only one site, Casey Creek (CRR200015), to have an IBI rated as good, with the rest being fair (Table 9). In the wadeable streams, four sites had IBI ratings of good: South Fork of Little River (CRR200002), North Fork of Little River (CRR200007), Sinking Fork Creek (CRR200010), and Little River (CRR200013) (Table 10). Missing sites were not sampled due to high water, and CRR20001 was not sampled in September, as it was dry.

The IBI indicated several sites rated as poor or very poor: two sites on the Upper Branch of the North Fork of Little River (CRR20004, CRR20005), Casey Creek (CRR200014) and Sinking Fork Creek (CRR200016). Casey Creek (CRR200014), September, was rated very poor by the IBI; however, this may be an artifact of sampling method. All the sites were sampled with a backpack electorshocker, making it difficult to accurately assess sites with deep pools. Low IBI scores had consistently low metric

values for most or all of the 12 metrics calculated as well as having low number of individual fish.

A regression line was calculated to indicate the expected value (Fig. 4). Many of our IBI values deviated from the expected value, indicating other variables such as nutrient enrichment and siltation were influencing the fish community and species richness.

For individual sites there were no difference between the average number fish of species collected in July and September or between the IBI scores for the two dates.

The average number of species in July was  $8.5 \pm 3.7$  and  $8.5 \pm 4.4$  in September. IBI scores were  $3.73 \pm 11.22$  in July and  $4.4 \pm 12.83$  in September.

Table 9: Index of Biotic Integrity (IBI) for fish samples within the Headwater streams (catchment <11mi<sup>2</sup>) in the Interior Plateau Ecoregion in Western Kentucky. If possible, every stream was sampled in the late spring and early fall.

Stream Code	Stream Name	Date	D A	T S	D S	H S	M S	I T	% T	% <sup>1</sup> S	% <sup>2</sup> O	% <sup>4</sup> S	I N	S L	E L	% D <sup>3</sup>	V A
			D A	T S	D S	H S	M S	I T	% T	% <sup>1</sup> S	% <sup>2</sup> O	% <sup>4</sup> S	I N	S L	E L	% D <sup>3</sup>	V A
CRR20001	South Fork	7/06/00	4.2	7	5	1	3	3	5	3	3	1	1	42.62	3	42.62	F
CRR20003	Lower Branch	7/07/00	2.95	7	5	2	3	1	3	1	1	2	3	12.90	5	16.12	F
CRR20003	Lower Branch	10/05/00	2.95	8	5	1	3	-	1	1	1	1	1	5.813	5	11.62	F
CRR20015	Casey	6/29/00	8.25	10	5	3	5	4	5	3	3	2	3	18.36	5	20.40	G
CRR20015	Casey	10/26/00	8.25	4	3	2	3	1	3	1	1	1	1	13.43	5	14.92	F
															5	42	
															5	42	

1 A score of "1" is given if the number of individuals is equal to or less than 25.

2 A score of "1" is given if the number of individuals is equal to or less than 25.

3 A score of "1" is given if the number of individuals is equal to or less than 25.

4 At headwater sites  $\geq 8 \text{ mi}^2$  this metric is scored a "1" if there are fewer than 50 total individuals collected.

DA=Drainage Area

TS=Total Species

DS= Number of Darters and Sculpins

HS= Number of Headwater Species

MS=Number of Minnow Species

IT=Number of Intolerant Species

%T=Percent Tolerant Species

%O=Percent Omnivore

%I=Percent Insectivores

%P=Percent Pioneer

Ind=Number of Individuals

SLS=Percent Simple Lithophilic Spawners

$\Sigma$  = Sum of each metric score (S)

Value = Water quality based on the sum of the metric score

Table 10: Index of Biotic Integrity (IBI) for fish in wadeable streams (catchment >11mi<sup>2</sup>) in the Interior Plateau Ecoregion. If possible, each site was sampled in the late spring and early fall

Stream Code	Site	Date	D	T	S	S	F	S	K	I	%	% <sup>1</sup>	% <sup>2</sup>	T	C	S	S	L	E	D <sup>3</sup>									
			A	S	S	P	S	P	S	T	S	T	S	I	S	IND	S	S	T	S	Σ	Value							
CRR20002	S Fk	7/21/00	23.29	14	5	2	3	3	5	-	1	5	3	14.72	5	31.00	3	65.89	5	2	5	129	5	2	1	0	5	46	F/G
CRR20002	S Fk	10/5/00	23.29	14	5	2	3	3	5	1	3	5	3	21.83	5	22.98	3	71.26	5	1	3	87	3	2	1	0	5	44	F
CRR20004	Upper Br NF	7/25/00	16.29	6	3	1	1	2	3	-	1	2	1	15.78	5	15.78	1	84.21	1	-	1	19	1	-	1	0	1	20	VP
CRR20004	Upper Br NF	10/5/00	16.29	4	3	1	1	-	1	-	1	1	1	-	5	-	1	100	1	-	1	14	1	1	1	0	1	18	VP
CRR20005	S Fk of LR	7/25/00	45.39	3	1	-	1	2	3	-	1	2	1	-	5	-	1	84.61	1	1	3	13	1	1	1	0	1	20	VP
CRR20005	S Fk of LR	10/5/00	45.39	4	1	1	1	3	5	-	1	3	3	15.38	5	-	1	92.30	1	1	3	13	1	1	1	0	1	24	VP/P
CRR20006	N Fk of LR	7/25/00	54.2	8	1	-	3	3	1	-	1	2	3	37.73	5	20.75	5	67.92	5	2	1	53	1	-	1	0	5	36	P/F
CRR20006	N Fk of LR	10/10/00	54.2	9	3	-	1	3	5	-	1	3	1	5.797	3	1.449	3	94.20	5	2	5	69	3	-	1	0	5	42	F
CRR20007	N Fk of LR	7/26/00	58.54	11	3	2	3	4	5	1	3	4	3	5.882	5	2.941	1	41.17	1	1	5	34	1	4	3	0	1	34	P
CRR20007	N Fk of LR	10/10/00	58.54	13	5	2	3	3	5	1	3	4	3	8.108	5	12.16	5	82.43	5	2	5	74	3	3	3	0	5	50	G
CRR20008	N Fk of LR	7/25/00	46.16	8	3	-	1	3	5	-	1	1	1	40.90	3	22.72	1	72.72	1	-	1	22	1	-	1	0	1	20	VP
CRR20008	N Fk of LR	10/10/00	46.16	9	3	1	1	2	3	1	3	2	1	9.756	5	7.317	5	92.68	1	-	1	41	1	-	1	0	5	30	P
CRR2010	Sinking Fk	7/25/00	16.64	12	5	2	3	3	5	2	5	3	3	16.66	5	16.66	1	80.55	1	1	3	36	1	3	3	0	1	36	P/F
CRR2010	Sinking Fk	10/10/00	16.64	17	5	2	3	4	5	2	5	3	3	19.45	5	25.94	3	70.27	5	1	3	185	5	3	3	0	5	50	G
CRR2011	Sinking Fk	7/25/00	30.14	14	5	2	3	2	3	-	1	4	3	22.11	5	52.88	1	44.23	3	1	3	104	5	2	1	0	5	38	P/F
CRR2011	Sinking Fk	10/10/00	30.14	10	3	1	1	2	3	1	3	3	3	10.25	5	11.53	5	88.46	5	1	1	78	3	1	0	5	38	P/F	
CRR2013	Little River	7/26/00	243.72	10	3	3	3	3	5	1	3	5	3	2.439	5	2.439	5	68.29	5	1	3	82	3	3	3	0	5	46	F/G
CRR2014	Casey Creek	7/18/00	30.72	8	3	2	3	1	3	-	1	2	1	2.259	5	2.824	5	94.91	5	-	1	177	5	3	3	0	5	40	F
CRR2014	Casey Creek	10/12/00	30.72	4	1	2	1	-	1	-	1	2	1	-	5	-	1	96	1	-	1	25	1	2	1	0	1	16	VP
CRR2016	Sinking Fk	7/26/00	106.93	1	1	v	1	-	1	-	1	1	1	-	5	-	1	100	1	-	1	34	1	1	0	1	16	VP	
CRR2016	Sinking Fk	10/12/00	106.93	6	1	1	1	1	1	-	1	2	1	7.692	5	11.53	1	84.61	1	-	1	26	1	2	1	0	1	16	VP

A score of "1" is assigned when fewer than 50 individuals are collected.

<sup>2</sup> A score of "2" is automatically when fewer than 50 total individuals are present.

<sup>3</sup> A score of "2" is automatically when fewer than 50 total individuals are present.

DA=Drainage Area

TS=Total Species

DSP= Number of Darter Species

SFP=Total Number of Sunfish Species

SKP=total Number of Sucker Species

IT=Number of Intolerant Species

%T=Percent Tolerant Species

%O=Percent Omnivore

%I=Percent Insectivores

TCS = Number of Top Carnivore Species

Ind=Number of Individuals

SLS=Percent Simple Lithophilic Spawners

Σ = Sum of each metric score (S)

Value = Water quality based on the sum of the metric score

### **Comparison with KDOW 1988 Little River Study**

**Diatoms.** KDOW identified 224 algal taxa in the spring and summer samples from 1988, and we identified 185 taxa in July and 203 taxa in September 2000. Four pollution tolerant taxa dominated the diatom communities in 1996: *Gomphonema parvulum*, *Navicula veneta*, *Navicula minima*, and *Navicula subminuscula*. The 2000 study sites were dominated by two of the same pollutant tolerant taxa: *Gomphonema parvulum* and *Navicula minima*.

**Macroinvertebrates.** KDOW collected 177 taxa from the Donaldson and Little River system in April 1996; 162 taxa were identified in the Little River basin in July 2000. As was observed in the 1996 study, few unionid mollusks were present at any of the study sites.

**Fish.** Thirty-one species of fish were collected in April 1996 in Little River system and 30 taxa were collected in July 2000. Fish data showed very little change between 1996 and 2000 studies.

### **Summary.**

Overall results of the two studies were quite similar. The KDOW found that the most impacted sites were on the North Fork of Little River, near Hopkinsville, as a result of wastewater treatment plants. Our data varied from those results with only one site on the North Fork indicating sewage effluent. Casey Creek, Sinking Fork Creek, and the

upper most sites on the North Fork of Little River were the highest quality sites in their study and ours.

KDOW (1996) found more stream reaches apparently impacted by point source pollution around the Hopkinsville area (i.e., sewage) than were found in the present study.

## **Conclusion**

No site scored a good or excellent in every index category (i.e., habitat, fish, macroinvertebrates, and diatoms). Casey Creek (CRR200015) scored a good in every category except macroinvertebrates, and the most upstream site on Sinking Fork (CRR200010) scored a good in all categories except diatoms.

Twelve, of the sixteen sites, had bioassessment index values of poor or very poor (Table 11). Four of these sites, all on the North Fork of Little River, had poor/very poor scores in July and September (CRR200004, CRR200005, CRR200007, CRR200008) and two reaches on Sinking Fork (CRR200011 and CRR200016) also scored poor/very poor in both months. One interesting result (Table 11) is the differences in the metrics indicating poor or very poor stream quality. Fish and macroinvertebrates are clearly responding to a loss in habitat, but diatoms are not. It is possible that the increase in nutrients and loss of shade are increasing diatom abundances and diversity, making the DBI results less accurate for assessing habitat impacts and nutrient enrichment in the Little River Basin.

Study reach CRR200004 on the North Fork of Little River was paralleled by a highway, had an automobile garage upstream, was deeply channelized, had a silty/clay

bottom, and little habitat for organisms. Collection of all organisms was difficult because the water was deep. Nitrate and phosphate were not particularly elevated (CRR unpublished data).

Study reach CRR200005 on the North Fork of Little River was located in the Trail of Tears Commemorative Park. The invertebrates were processed incorrectly in September, making those data difficult to interpret; however, habitat and fish scored poorly and macroinvertebrates, fish, and habitat scored poorly in July. CRR20005 was similar to CRR200005, being very deep (over 4 meters deep in much of the channel) with little debris as habitat for fish and invertebrates. The site is located near a major highway and located in downtown Hopkinsville. Nitrate and phosphate were not elevated in July (CRR, unpublished data).

Study reach CRR200007 on the North Fork of Little River was similar to the above two sites. It had very little habitat, extremely silty bottom and eroding banks, deep water, and low flow. This site was directly downstream from a wastewater treatment site; however, nutrient levels in July were not elevated.

Study reach CRR200008 on the North Fork of Little River is located on the west side of Hopkinsville. It is located in the city limits, with many residential houses close to the stream. The stream banks were eroded, the bottom silty, with a lot of man-made objects in the stream. Nitrate and phosphate were very high in July (CRR unpublished data), indicating the possibility of sewage input into the stream.

Study reach CRR200011 on Sinking Fork creek was located off U.S. highway 68-80 on the west side of Hopkinsville. We sampled downstream of the bridge, as upstream was very deep with riprap in the channel and on the banks of the creek. The

surrounding land was pasture on one side and old-field on the other. Nutrients were not elevated in this part of the creek in July (CRR, unpublished data).

Study reach CRR200016, on Sinking Fork Creek, is located near the town of Cadiz, KY. Cornfields, forest, and a pasture surround the site. The habitat was good for organisms, erosion was low, and the riparian area was relatively intact. Nitrogen levels were very high in July, while phosphate was low, pointing to possible excessive runoff from agricultural fields (CRR, unpublished data).

The most common disturbances to the stream in the Little River Basin were lack of habitat for aquatic organisms, deep, eroded, channelized streambeds, loss of riparian area, and runoff from agricultural fields. However, at least one stream in the Hopkinsville area is likely receiving excessive sewage inputs.

Table 11: Streams scoring Poor or Very Poor for one or all of the biological or habitat assessments in the Little River Basin. Habitat = habitat assessment score, DBI = Diatom Biotic Index, MBI = Macroinvertebrate Biotic Index, IBI = Index of Biotic Integrity for fish.

Site Code	Stream Name	Date	Habitat	DBI	MBI	IBI
CRR200001	South Fork LR	July			X	
CRR200002	South Fork LR	July	X	X		
CRR200003	Lower Branch LR	September			X	
CRR200004	North Fork LR	July			X	X
CRR200004	North Fork LR	September				X
CRR200005	North Fork LR	July	X		X	X
CRR200005	North Fork LR	September	X		X	X
CRR200007	North Fork LR	July	X			X
CRR200007	North Fork LR	September	X			X
CRR200008	North Fork LR	July	X			X
CRR200008	North Fork LR	September	X			X
CRR200009	Little River	September			X	
CRR200010	Sinking Fork	July			X	
CRR200011	Sinking Fork	July			X	X
CRR200011	Sinking Fork	September			X	
CRR200013	Little River	September			X	
CRR200014	Casey	September				X
CRR200015	Casey	September			X	
CRR200016	Sinking Fork	July				X
CRR200016	Sinking Fork	September			X	X

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**APPENDIX A**

**PHOTOGRAPHS OF EACH STUDY SITE**

## **SOUTH FORK OF LITTLE RIVER**

### **CRR200001**



Predominant Substrate: Sand (40%), Gravel (25%), Bedrock(18%), Silt (10%), Cobble (3%), Boulder (2%), Detritus (2%)

Canopy Cover: Partially Shaded (50-75%)

Habitat Cover Types: Undercut Banks, Tree Roots, Coarse Woody Debris, Large Boulders

Surrounding Land Use: Row Crops, Pasture Grazing, Residential

Erosion: Moderate

## **SOUTH FORK OF LITTLE RIVER**

### **CRR20002**



Predominant Substrate: Sand (30%), Silt (20%), Bedrock (20%), Clay (10%), Cobble (10%),  
Detritus (5%), Boulder (5%)

Canopy Cover: Partially Shaded (50-75%)

Habitat Cover Types: Undercut Banks, Tree Roots, Coarse Woody Debris, Boulders

Surrounding Land Use: Row Crops, Pasture Grazing

Erosion: Moderate-Heavy

## **LOWER BRANCH OF LITTLE RIVER**

### **CRR200003**



Predominant Substrate: Clay (60%), Sand (20%), Silt (10%), Gravel (10%)

Canopy Cover: Partially Exposed (25-50%)

Habitat Cover Types: Undercut Banks, Tree Roots, Coarse Woody Debris

Surrounding Land Use: Row Crops, Pasture Grazing, Residential

Erosion: Moderate

## **UPPER BRANCH OF LITTLE RIVER**

**CRR200004**



Predominant Substrate: Sand (55%), Silt (20%), Boulder (10%), Detritus (10%), Cobble (5%)

Canopy Cover: Partially Shaded (50-75%)

Habitat Cover Types: Under Cut Banks, Rock Ledges, Tree Roots, Coarse Woody Debris, Boulders

Surrounding Land Use: Row Crops, Automobile Shop

Erosion: Moderate

## **SOUTH FORK OF LITTLE RIVER**

**CRR200005**



Predominant Substrate: Cobble (45%), Silt (20%), Sand (20%), Clay (5%), Boulder (5%), Detritus (5%)

Canopy Cover: Partially Exposed (25-50%)

Habitat Cover Types: Undercut Banks, Rock Ledges, Tree Roots, Coarse Woody Debris, Boulders

Surrounding Land Use: Industrial, Residential

Erosion: Moderate

## **NORTH FORK OF LITTLE RIVER**

### **CRR200006**



Predominant Substrate: Sand (40%), Silt (20%), Clay (20%), Boulder (5%), Cobble (5%), Gravel (5%),  
Detritus (5%)

Canopy Cover: Partially Shaded (50-75%)

Habitat Cover Types: Undercut Banks, Rock Ledges, Coarse Woody Debris, Man-made Objects

Surrounding Land Use: Row Crops, Pasture Grazing, Residential

Erosion: Moderate

## **NORTH FORK OF LITTLE RIVER**

**CRR200007**



Predominant Substrate: Clay (50%), Silt (20%), Sand (20%), Detritus (10%)

Canopy Cover: Partially Shaded (50-75%)

Habitat Cover Types: Undercut Banks, Rock Ledges, Tree Roots, Coarse Woody Debris, Man-made Objects

Surrounding Land Use: Waste Water Treatment Plant, Row Crops, Residential, Forest

Erosion: Heavy

## **NORTH FORK OF LITTLE RIVER**

**CRR200008**



Predominant Substrate: Sand (60%), Silt (20%), Detritus (10%), Cobble (5%), Gravel (5%)

Canopy Cover: Partially Shaded (50-75%)

Habitat Cover Types: Undercut Banks, Tree Roots, Coarse Woody Debris, Man-made Objects

Surrounding Land Use: Row Crops, Residential

Erosion: Heavy

## LITTLE RIVER

CRR200009



Predominant Substrate: Sand (30%), Silt (25%), Detritus (20%), Bedrock (20%), Boulder (5%)

Canopy Cover: Partially Exposed (25-50%)

Habitat Cover Types: Rock Ledges, Tree Roots, Coarse Woody Debris

Surrounding Land Use: Residential, Row Crops, Forest, Pasture Grazing

Erosion: Moderate

## SINKING FORK CREEK

CRR200010



Predominant Substrate: Bedrock (50%), Gravel (20%), Detritus (10%), Sand (5%), Silt (5%),  
Cobble (5%), Boulder (5%)

Canopy Cover: Partially Shaded (50-75%)

Habitat Cover Types: Undercut Banks, Tree Roots, Coarse Woody Debris, Boulders

Surrounding Land Use: Row Crops, Pasture Grazing, Residential

Erosion: Moderate

## **SINKING FORK**

**CRR200011**



Predominant Substrate: Sand (30%), Bedrock (30%), Clay (15%), Detritus (15%)Gravel (5%), Silt (5%)

Canopy Cover: Partially Shaded (50-75%)

Habitat Cover Types: Undercut Banks, Tree Roots, Coarse Woody Debris

Surrounding Land Use: Row Crops, Pasture Grazing, Residential

Erosion: Moderate

## LITTLE RIVER

CRR200012



Predominant Substrate: Bedrock (50%), Sand (15%), Silt (12%), Gravel (10%), Cobble (5%), Detritus (5%),  
Boulder (3%)

Canopy Cover: Partially Exposed (25-50%)

Habitat Cover Types: Undercut Banks, Rock Ledges, Tree Roots, Coarse Woody Debris

Surrounding Land Use: Row Crop, Forest, Pasture Grazing, Residential

Erosion: Moderate

## LITTLE RIVER

CRR200013



Predominant Substrate: Gravel (40%), Sand(20%), Cobble (20%), Silt (8%), Clay(8%), Boulder (2%),  
Detritus (2%)

Canopy Cover: Fully Exposed (0-25%)

Habitat Cover Types: Undercut Banks, Tree Roots, Coarse Woody Debris

Surrounding Land Use: Row Crops, Pasture Grazing, Residential

Erosion: Moderate

## CASEY CREEK

CRR200014



Predominant Substrate: Gravel (60%), Sand (20%), Cobble (10%), Silt (5%), Detritus (5%)

Canopy Cover: Partially Exposed (25-50%)

Habitat Cover Types: Undercut Banks, Tree Roots, Coarse Woody Debris

Surrounding Land Use: Row Crops, Forest, Pasture Grazing

Erosion: Minimal-Moderate

# CASEY CREEK

**CRR200015**



Predominant Substrate: Gravel (50%), Sand (20%), Silt (10%) , Clay (5%) , Bedrock (5%) ,  
Detritus (5%) , Cobble (5%)

Canopy Cover: Partially Exposed (50-75%)

Habitat Cover Types: Undercut Banks, Tree Roots, Coarse Woody Debris

Surrounding Land Use: Row Crops, Pasture Grazing, Forest

Erosion: Moderate

## **SINKING FORK**

**CRR200016**

Predominant Substrate:

Gravel (50%), Sand (30%), Detritus (10%),

Cobble (5%), Boulder (5%)

Canopy Cover: Partially Shaded (50-75%)

Habitat Cover Types:

Undercut Banks, Tree Roots, Coarse Woody Debris

Surrounding Land Use: Row Crops, Forest

Erosion: Moderate



**APPENDIX B**  
**TAXA LIST**

**Station ID:** CRR200001      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** SOUTH FORK LITTLE RIVER  
**County:** CHRISTIAN      **Map Name:** HONEY GROVE  
**Catchment Area:** 4.2      **River Mile:** 80.74      **Stream Order:** 4  
**Lat Dec:** 36.88174      **Long Dec:** -87.34167  
**Location:** S.R. 508 @ BRIDGE

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## Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/19/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	2	
Striped Shiner	<i>Luxilus chryscephalus</i>	19	
Creek Chub	<i>Semotilus atromaculatus</i>	7	
White Sucker	<i>Catostomus commersoni</i>	19	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	9	
Bluegill	<i>Lepomis macrochirus</i>	2	
Fringed Darter	<i>Etheostoma crossopterum</i>	3	

## Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/06/00</b>
Dubiraphia sp (adult)	3	
Heterosternuta sp	1	
Unidentified Cambaridae	3	
Unidentified Coenagrionid	19	
Physella sp	145	
Elimia sp	2	
Promenetus sp	20	
Sphaerium sp	3	
Limnodrilus sp	4	
Unidentified Hirudinea	1	
Stenonema sp	7	
Caenis sp	6	
Enallagma sp	4	
Aeshna sp	2	
Boyeria vinosa	12	
Sigara sp	6	
Trichocorixa sp	7	
Rhagovelia sp	1	
Ranatra sp	1	
Mesovelia sp	2	
Hydrometra sp	1	
Gerris sp	3	
Rheumatobates sp	1	
Sialis sp	1	
Polycentropus sp	1	
Helichus sp	1	
Peltodytes sp	1	
Peltodytes sp	4	
Cyphon sp	6	
Helophorus sp	1	
Enochrus sp	1	
Paracymus sp	1	
Tropisternus sp	1	
Gyrinus sp	1	
Neoporus sp	4	
Neoporus sp	1	
Dubiraphia sp (larvae)	1	
Stenelmis sp	1	
Unidentified Tipulid	1	
Cryptochironomus sp	2	

Dicrotendipes sp	74
Endochironomus sp	1
Krenopelopia sp	1
Microspectra sp	2
Microtendipes sp	7
Nanocladius sp	1
Parametriocnemus sp	2
Paratanytarsus sp	7
Paratendipes sp	2
Phaenopsectra sp	21
Polypedilum sp	16
Procladius sp	2
Stictochironomus sp	3
Tanytarsus sp	3
Unidentified Chironomid	2
Chrysops sp	2
Caecidotea sp	6

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/06/00</b>
Achnanthes pusilla		4	
Achnanthes sp. 2		10	
Achnanthidium minutissimum		28	
Amphora perpusilla		4	
Cocconeis placentula var. euglypta		2	
Cocconeis placentula var. lineata		8	
Cymbella affinis		6	
Cymbella sp.		2	
Gomphonema parvulum		6	
Hippodonta capitata		2	
Melosira varians		1	
Navicula cryptocephala		2	
Navicula cryptotenella		10	
Navicula decussis		6	
Navicula minima		107	
Navicula saxophila		4	
Navicula schmassmannii		2	
Navicula schroeteri var. escambia		2	
Navicula sp. 8		1	
Navicula subatomoides (like)		9	
Navicula viridula var. linearis		2	
Nitzschia amphibia		8	
Nitzschia denticula		1	
Nitzschia frustulum		16	
Nitzschia hungarica		4	
Nitzschia palea		2	
Nitzschia sp.		9	
Planothidium lanceolata		2	
Rhoicosphenia curvata		6	
Rossithidium linearis f. curta		97	
Surirella ovata		2	
Synedra ulna		4	

<b>Non Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/06/00</b>
Euglena sp.		5	
Merismopedia punctata		3	
Oedogonium sp.		5	
Oscillatoria lutea		12	
Rhizoclonium hieroglyphicum		3	

*Schizothrix calcicola*  
Unidentified flagellate

36  
1000

**Station ID:** CRR200002      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** SOUTH FORK LITTLE RIVER  
**County:** CHRISTIAN      **Map Name:** PEMBROKE  
**Catchment Area:** 23.29      **River Mile:** 76.22      **Stream Order:** 3  
**Lat Dec:** 36.84893      **Long Dec:** -87.37433  
**Location:** E. HOPKINSVILLE UPSTREAM OF HWY 68-80 BRIDGE

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## Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/21/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	1	
Striped Shiner	<i>Luxilus chrysocephalus</i>	26	
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	65	
Bluntnose Minnow	<i>Pimephales notatus</i>	13	
Yellow Bullhead	<i>Ameiurus natalis</i>	1	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	2	
Western Mosquitofish	<i>Gambusia affinis</i>	2	
Banded Sculpin	<i>Cottus carolinae</i>	2	
Rockbass	<i>Ambloplites rupestris</i>	1	
Green Sunfish	<i>Lepomis cyanellus</i>	5	
Longear Sunfish	<i>Lepomis megalotis</i>	4	
Largemouth Bass	<i>Micropterus salmoides</i>	2	
Fringed Darter	<i>Etheostoma crossopterum</i>	2	
Snubnose Darter	<i>Etheostoma simoterum</i>	3	

## Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/03/00</b>
Unidentified Cambaridae	11	
<i>Physella</i> sp	2	
<i>Elimia</i> sp	20	
<i>Gyraulus parvus</i>	1	
<i>Sphaerium</i> sp	2	
<i>Corbicula fluminea</i>	1	
<i>Lumbriculus</i> sp	1	
<i>Limnodrilus</i> sp	1	
<i>Stenacron</i> sp	4	
<i>Stenonema</i> sp	2	
<i>Caenis</i> sp	165	
<i>Fallceon</i> sp	2	
<i>Procloeon</i> sp	1	
<i>Boyeria vinosa</i>	7	
<i>Gomphus</i> sp	1	
<i>Somatochlora</i> sp	1	
<i>Sigara</i> sp	3	
<i>Microvelia</i> sp	1	
<i>Hydroptila</i> sp	2	
<i>Cheumatopsyche</i> sp	10	
<i>Peltodytes</i> sp	11	
<i>Peltodytes</i> sp	12	
<i>Berosus</i> sp A	3	
<i>Tropisternus</i> sp	1	
<i>Hydroporus</i> sp	2	
<i>Stenelmis</i> sp	1	
<i>Ablabesmyia</i> sp	1	
<i>Microtendipes</i> sp	1	
<i>Phaenopsectra</i> sp	7	
<i>Phaenopsectra/Tribelos</i> sp	3	
<i>Polypedilum</i> sp	1	
<i>Procladius</i> sp	3	
<i>Stictochironomus</i> sp	4	
<i>Thienemannimyia</i> gr	9	

Simulium sp	32
Unidentified Simuliid	4
Gammarus sp	1
Lirceus fontinalis	2

Diatoms	Taxa	Individuals	07/03/00
	Achnanthes hauckiana	2	
	Achnanthes microcephala	6	
	Achnanthidium minutissimum	12	
	Amphora perpusilla	14	
	Amphora sp.	6	
	Coccconeis pediculus	18	
	Coccconeis placentula	41	
	Coccconeis placentula var. euglypta	4	
	Cymatopleura solea	4	
	Cymbella sp.	2	
	Luticola mutica	1	
	Navicula atomus	2	
	Navicula auriculata	2	
	Navicula cryptotenella	2	
	Navicula decussis	4	
	Navicula menisculus	4	
	Navicula minima	104	
	Navicula rhynchocephala var. germanii	2	
	Navicula saxophila	2	
	Navicula seminulum	19	
	Navicula sp. 3	2	
	Navicula subatomoides (like)	8	
	Navicula subtilissima	8	
	Navicula trivialis	2	
	Nitzschia amphibia	30	
	Nitzschia dissipata	1	
	Nitzschia frustulum	6	
	Nitzschia sp.	3	
	Nitzschia sp. 4	1	
	Nitzschia sp. 5	1	
	Planothidium lanceolata	2	
	Planothidium lanceolata var. dubia	6	
	Rhoicosphenia curvata	21	
	Rossithidium linearis f. curta	8	
Non-Diatom Algae	Taxa	Individuals	07/03/00
	Chamaesiphon incrustans	1000	
	Encyonema mesianum	4	
	Oedogonium sp.	8	
	Oscillatoria sp.	2	
	Rhizoclonium hookeri	1000	
	Schizothrix calcicola	1000	

## Fishes

Common Name	Scientific Name	Individuals	10/05/00
Largescale Stoneroller	<i>Campostoma oligolepis</i>	4	
Striped Shiner	<i>Luxilus chrysocephalus</i>	6	
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	12	
Bluntnose Minnow	<i>Pimephales notatus</i>	11	
Creek Chubsucker	<i>Erimyzon oblongus</i>	2	
Yellow Bullhead	<i>Ameiurus natalis</i>	1	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	2	
Western Mosquitofish	<i>Gambusia affinis</i>	19	
Banded Sculpin	<i>Cottus carolinae</i>	5	
Rockbass	<i>Ambloplites rupestris</i>	1	
Green Sunfish	<i>Lepomis cyanellus</i>	7	
Longear Sunfish	<i>Lepomis megalotis</i>	11	
Fringed Darter	<i>Etheostoma crossopterum</i>	4	
Snubnose Darter	<i>Etheostoma simoterum</i>	2	

## Invertebrates

Taxa	Individuals	09/14/00
Dubiraphia sp (adult)	1	
Hydrobiomorpha sp	1	
Physella sp	11	
Elimia sp	111	
Sphaerium sp	6	
Corbicula fluminea	1	
Unidentified Tubificidae	8	
Caenis sp	7	
Acerpenna sp	2	
Procloeon sp	3	
Enallagma sp	15	
Calopteryx sp	1	
Basiaeschna janata	1	
Boyeria vinosa	1	
Epitheca (Epicordulia) sp	3	
Sigara sp	6	
Microvelia sp	4	
Belostoma sp	1	
Hydroptila sp	6	
Hydroptila sp	12	
Cheumatopsyche sp	11	
Polycentropus sp	1	
Psephenus herricki	1	
Peltodytes sp	22	
Berosus sp A	1	
Berosus sp(larvae)	4	
Neoporus sp	1	
Dubiraphia sp (larvae)	1	
Macronychus glabratus	1	
Stenelmis sp	1	
Stenelmis sp	4	
Tipula sp	5	
Dicrotendipes sp	1	
Larsia sp	1	
Nanocladius sp	1	
Paratendipes sp	4	
Phaenopsectra sp	1	
Polypedilum sp	4	
Procladius sp	2	
Rheotanytarsus sp	1	

Stempellina sp	2
Stictochironomus sp	1
Tanytarsus sp	1
Thienemannimyia gr	9
Unidentified Chironomid	3
Bezzia/Palpomyia gr	1
Lirceus fontinalis	1

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/14/00</b>
Achnanthes curtissima		6	
Achnanthidium minutissimum		164	
Amphipleura pellucida		2	
Amphora ovalis var. affinis		2	
Caloneis bacillum		2	
Cocconeis pediculus		9	
Cocconeis placentula var. euglypta		13	
Cocconeis placentula var. lineata		2	
Diadesmis confervacea		17	
Eunotia curvata		10	
Gomphonema affine		2	
Gyrosigma scalproides		4	
Navicula cryptocephala		2	
Navicula menisculus		8	
Navicula minima		6	
Navicula schadei		2	
Navicula sp.		2	
Navicula tantula		6	
Navicula tenera		4	
Navicula tripunctata		2	
Nitzschia amphibia		16	
Nitzschia frustulum		4	
Nitzschia recta		2	
Nitzschia sp.		6	
Planothidium lanceolata var. dubia		6	
Rhoicosphenia curvata		11	
Rossithidium linearis f. curta		4	
Stephanocyclus meneghiniana		3	
Surirella ovata		2	
Synedra rumpens		14	
Synedra rumpens var. fragilaroides		16	
Synedra ulna		19	

<b>Non- Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/14/00</b>
Chamaesiphon incrustans		50	
Characium pringsheimii		50	
Lemanea cf. fluviatilis		8	
Mougeotia sp.		1	
Pithophora kewensis		1000	
Porphyrosiphon splendidus		1000	
Rhizoclonium hookeri		1000	
Schizothrix calcicola		1000	

**Station ID:** CRR200003      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** LOWER BRANCH NORTH FORK LR  
**County:** CHRISTIAN      **Map Name:** KELLY  
**Catchment Area:** 2.95      **River Mile:** 79.54      **Stream Order:** 3  
**Lat Dec:** 36.89947      **Long Dec:** -87.39161  
**Location:** 507 N.E. HOPKINSVILLE-BEHIND CHURCH APP. 150 M

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### Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/19/00</b>
Bluntnose Minnow	<i>Pimephales notatus</i>	4	
Creek Chubsucker	<i>Erimyzon oblongus</i>	1	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	17	
Bluegill	<i>Lepomis macrochirus</i>	2	
Longear Sunfish	<i>Lepomis megalotis</i>	1	
Fringed Darter	<i>Etheostoma crossopterum</i>	3	
Orangethroat Darter	<i>Etheostoma spectabile</i>	3	

### Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/07/00</b>
Dubiraphia sp (adult)	14	
Hebrus sp	1	
Hydraena sp	3	
Pentacora sp	3	
Unidentified Isotomid	2	
Lymnaea sp	30	
Physella sp	100	
Helisoma sp	2	
Menetus dilatatus	60	
Pisidium sp	13	
Limnodrilus sp	8	
Unidentified Hirudinea	4	
Stenonema sp	2	
Caenis sp	9	
Procloeon sp	11	
Boyeria vinoso	1	
Ophiogomphus sp	1	
Trichocorixa sp	2	
Microvelia sp	2	
Rhagovelia sp	6	
Gerris sp	2	
Trepobates sp	8	
Hydroptila sp	13	
Peltodytes sp	4	
Peltodytes sp	4	
Cyphon sp	2	
Berosus sp A	13	
Berosus sp(larvae)	6	
Dubiraphia sp (larvae)	2	
Macronychus glabratu	1	
Stenelmis sp	1	
Ablabesmyia sp	2	
Chironomus sp	3	
Cryptochironomus sp	18	
Dicrotendipes sp	52	
Glyptotendipes sp	10	
Krenopelopia sp	1	
Nanocladius sp	1	
Paratanytarsus sp	14	
Phaenopsectra sp	3	
Polypedilum sp	25	

Procladius sp	2
Pseudochironomus sp	2
Stenochironomus sp	1
Sublettea sp	1
Tanytarsus sp	27
Thienemannimyia gr	1
Unidentified Chironomid	6
Bezzia/Palpomyia gr	34
Probezzia sp	5
Unidentified Ceratopogonid	27
Lirceus fontinalis	4

Diatoms	Taxa	Individuals	07/07/00
	Achnanthes hauckiana	2	
	Achnanthes sp. 2	5	
	Achnanthidium minutissimum	60	
	Amphora ovalis var. affinis	2	
	Amphora perpusilla	2	
	Caloneis hyalina	4	
	Caloneis lewisii var. inflata	2	
	Coccconeis pediculus	2	
	Coccconeis placentula var. euglypta	2	
	Coccconeis placentula var. lineata	2	
	Cymatopleura solea	2	
	Cymbella affinis	2	
	Cymbella minuta	8	
	Gyrosigma scalproides	2	
	Hantzschia amphioxys	2	
	Hippodonta capitata	3	
	Karayevia clevei	2	
	Melosira granulata	4	
	Meridion circulare	2	
	Navicula cryptocephala	10	
	Navicula cryptotenella	4	
	Navicula decussis	4	
	Navicula lenzii	2	
	Navicula menisculus	4	
	Navicula minima	20	
	Navicula paucivisitata	2	
	Navicula rhynchocephala	8	
	Navicula saxophila	9	
	Navicula schmassmannii	2	
	Navicula schroeteri var. escambia	8	
	Navicula subatomoides (like)	6	
	Navicula tenelloides	2	
	Navicula tripunctata	6	
	Navicula viridula var. linearis	9	
	Nitzschia capitellata	7	
	Nitzschia denticula	25	
	Nitzschia dissipata	1	
	Nitzschia dubia	4	
	Nitzschia linearis	3	
	Nitzschia sinuata var. tabellaria	100	
	Nitzschia sp.	12	
	Planothidium lanceolata	4	
	Reimeria sinuata	2	
	Rossithidium linearis	41	
	Scenedesmus obliquus	1	
	Stauroneis smithii	2	
	Stephanodiscus sp.	2	

	Surirella angustata	2	
	Tryblionella tryblionella var. victoriae	2	
<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/07/00</b>
	Characium pringsheimii	20	
	Characium rostratum	25	
	Mougeotia sp.	1000	
	Oedogonium sp.	9	
	Oscillatoria lutea	1000	
	Porphyrosiphon splendidus	1000	
	Rhizoclonium hieroglyphicum	1000	
	Schizothrix friesii	1000	
	Unidentified filament	5	
<hr/>			
<b>Fishes</b>			
<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>10/05/00</b>
Bluntnose Minnow	<i>Pimephales notatus</i>	3	
Creek Chubsucker	<i>Erimyzon oblongus</i>	7	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	22	
Green Sunfish	<i>Lepomis cyanellus</i>	2	
Bluegill	<i>Lepomis macrochirus</i>	36	
Longear Sunfish	<i>Lepomis megalotis</i>	14	
Largemouth Bass	<i>Micropterus salmoides</i>	1	
Orangethroat Darter	<i>Etheostoma spectabile</i>	1	
<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>12/08/00</b>
	Unidentified Hydrobiid	2	
	Fossaria sp	22	
	Physella sp	20	
	Helisoma sp	49	
	Pisidium sp	1	
	Sphaerium sp	41	
	Unidentified Tubificidae	100	
	Caenis sp	1	
	Enallagma sp	1	
	Epitheca (Epicordulia) sp	1	
	Peltodytes sp	6	
	Cyphon sp	1	
	Berosus sp(larvae)	1	
	Dasyhelea sp	2	
	Neoporus sp	1	
	Dubiraphia sp (larvae)	1	
	Stenelmis sp	1	
	Hexatoma sp	1	
	Chironomus sp	12	
	Cladotanytarsus sp	7	
	Cricotopus/Orthocladius gr	11	
	Glyptotendipes sp	8	
	Hydrobaenus sp	114	
	Omisus sp (Epler)	1	
	Potthastia sp	1	
	Procladius sp	5	
	Stenochironomus sp	1	
	Stictochironomus sp	3	
	Tanytarsus sp	4	
	Culicoides sp	3	
	Probezzia sp	1	
	Lirceus fontinalis	13	

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/14/00</b>
	<i>Achnanthes pusilla</i>	4	
	<i>Achnanthes</i> sp. 2	10	
	<i>Achnanthidium minutissimum</i>	52	
	<i>Amphora perpusilla</i>	2	
	<i>Amphora submontana</i>	2	
	<i>Caloneis</i> sp.	2	
	<i>Chroococcus turgidus</i>	2	
	<i>Coccochloris elabans</i>	1	
	<i>Coccconeis pediculus</i>	5	
	<i>Coccconeis placentula</i> var. <i>lineata</i>	5	
	<i>Cymbella minuta</i>	2	
	<i>Cymbella silesiaca</i>	13	
	<i>Diploneis oblongella</i>	6	
	<i>Gomphonema parvulum</i>	6	
	<i>Gyrosigma scalpoides</i>	4	
	<i>Hippodonta capitata</i>	5	
	<i>Melosira varians</i>	14	
	<i>Navicula cryptocephala</i>	8	
	<i>Navicula cryptocephala</i> var. <i>veneta</i>	2	
	<i>Navicula cryptotenella</i>	7	
	<i>Navicula minima</i>	23	
	<i>Navicula rhynchocephala</i> var. <i>germanii</i>	2	
	<i>Navicula salinarum</i>	6	
	<i>Navicula secreta</i> var. <i>apiculata</i>	2	
	<i>Navicula</i> sp.	26	
	<i>Navicula subminuscula</i>	2	
	<i>Navicula trivialis</i>	2	
	<i>Navicula viridula</i> var. <i>rostellata</i>	2	
	<i>Nitzschia amphibia</i>	4	
	<i>Nitzschia denticula</i>	9	
	<i>Nitzschia dissipata</i>	5	
	<i>Nitzschia frustulum</i>	2	
	<i>Nitzschia linearis</i>	1	
	<i>Nitzschia palea</i>	4	
	<i>Nitzschia perminuta</i>	4	
	<i>Nitzschia sinuata</i> var. <i>tabellaria</i>	25	
	<i>Nitzschia</i> sp.	33	
	<i>Planothidium lanceolata</i>	3	
	<i>Rossithidium linearis</i> f. <i>curta</i>	72	
	<i>Stauroneis smithii</i>	2	
	<i>Stephanocyclus meneghiniana</i>	3	
	<i>Surirella angustata</i>	3	
	<i>Surirella ovata</i>	3	
	<i>Synedra radians</i>	1	
	<i>Synedra ulna</i>	5	
<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/14/00</b>
	<i>Aphanocapsa</i> sp.	1	
	<i>Eudorina elegans</i>	1	
	<i>Merismopedia punctata</i>	3	
	<i>Oedogonium</i> sp.	1000	
	<i>Oscillatoria lutea</i>	1000	
	<i>Pithophora kewensis</i>	1000	
	<i>Scenedesmus dimorphus</i>	2	
	<i>Scenedesmus quadricauda</i>	1	
	<i>Schizothrix calcicola</i>	1000	
	<i>Schizothrix friesii</i>	1000	

<i>Spirogyra</i> sp.	1000
<i>Spirulina</i> subsalsa	1

**Station ID:** CRR200004      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** UPPER BRANCH NORTH FORK LR  
**County:** CHRISTIAN      **Map Name:** KELLY  
**Catchment Area:** 16.29      **River Mile:** 74.47      **Stream Order:** 3  
**Lat Dec:** 36.88908      **Long Dec:** -87.45583  
**Location:** 107 N.E. HOPKINSVILLE -CLOSE TO 1682 INTERSECTION

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## Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/25/00</b>
Bluntnose Minnow	<i>Pimephales notatus</i>	3	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	1	
Western Mosquitofish	<i>Gambusia affinis</i>	8	
Bluegill	<i>Lepomis macrochirus</i>	2	
Longear Sunfish	<i>Lepomis megalotis</i>	2	
Fringed Darter	<i>Etheostoma crossopterum</i>	3	

## Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/06/00</b>
Dubiraphia sp (adult)	17	
Unidentified Cambaridae	3	
Physella sp	2	
Elimia sp	1	
Sphaerium sp	9	
Corbicula fluminea	2	
Eclipidrilus sp	1	
Limnodrilus sp	17	
Unidentified Heptageniid	1	
Unidentified Corixid	3	
Mesovelia sp	1	
Rheumatobates sp	1	
Cheumatopsyche sp	14	
Peltodytes sp	2	
Cyphon sp	1	
Laccobius sp	1	
Neoporus sp	10	
Dubiraphia sp (larvae)	6	
Macronychus glabratus	3	
Pilaria sp	1	
Ablabesmyia sp	11	
Chironomus sp	3	
Cryptochironomus sp	7	
Dicrotendipes sp	11	
Harnischia sp	1	
Helopelopia sp	1	
Krenopelopia sp	3	
Microspectra sp	2	
Nanocladius sp	1	
Parachironomus sp	5	
Paratendipes sp	1	
Polypedilum sp	172	
Procladius sp	3	
Rheotanytarsus sp	2	
Stenochironomus sp	10	
Stictochironomus sp	10	
Tanytarsus sp	8	
Tribelos sp	1	
Unidentified Chironomid	8	
Hyalella azteca	13	

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/06/00</b>
	Achnanthes sp. 2	2	
	Achnanthidium minutissimum	2	
	Amphora ovalis var. affinis	2	
	Amphora perpusilla	2	
	Cymbella triangulum	4	
	Entomoneis ornata	2	
	Gyrosigma scalproides	6	
	Gyrosigma spencerii var. curvula	13	
	Hippodonta capitata	2	
	Melosira ambigua	21	
	Melosira granulata	56	
	Melosira varians	56	
	Navicula cryptocephala	7	
	Navicula cryptotenella	8	
	Navicula cuspidata	2	
	Navicula hustedtii	2	
	Navicula lenzii	2	
	Navicula minima	41	
	Navicula saxophila	2	
	Navicula secreta var. apiculata	6	
	Navicula sp. 9	8	
	Navicula tenera	2	
	Navicula tripunctata	13	
	Navicula viridula	33	
	Nitzschia acicularis	4	
	Nitzschia amphibia	18	
	Nitzschia capitellata	2	
	Nitzschia dissipata	2	
	Nitzschia dubia	4	
	Nitzschia levidensis	4	
	Nitzschia linearis	4	
	Nitzschia sigma	4	
	Nitzschia sp.	8	
	Nitzschia sp. 4	2	
	Nitzschia sp. 5	1	
	Rossithidium linearis	6	
	Sellaphora pupula	3	
	Surirella ovata	2	
	Synedra parasitica var. subconstricta	2	
	Synedra rumpens var. familiaris	39	
	Synedra rumpens var. meneghiniana	2	
<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/06/00</b>
	Encyonema mesianum	4	
	Nostoc sp.	1	
	Schizothrix sp.	2	
	Unidentified filament	4	

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<b>Fishes</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>10/05/00</b>
	Pirate Perch	<i>Aphredoderus sayanus</i>	1	
	Blackspotted Topminnow	<i>Fundulus olivaceus</i>	1	
	Western Mosquitofish	<i>Gambusia affinis</i>	10	
	Slabrock Darter	<i>Etheostoma smithi</i>	2	

Invertebrates	Taxa	Individuals	09/14/00
	Dubiraphia sp (adult)	18	
	Unidentified Hydrobiid	1	
	Physella sp	16	
	Elimia sp	10	
	Pisidium sp	6	
	Sphaerium sp	6	
	Corbicula fluminea	18	
	Eclipidrilus sp	1	
	Branchiura sowerbyi	2	
	Unidentified Tubificidae	2	
	Stenacron sp	20	
	Caenis sp	3	
	Procloeon sp	30	
	Argia sp	17	
	Boyeria vinosa	4	
	Hagenius sp	2	
	Perithemis sp	2	
	Somatochlora sp	2	
	Unidentified Libellulid	1	
	Unidentified Corixid	3	
	Gerris sp	1	
	Trepobates sp	1	
	Oecetis sp	10	
	Cyphon sp	1	
	Berosus sp(larvae)	1	
	Neoporus sp	5	
	Ancyronyx variegatus	10	
	Dubiraphia sp (larvae)	44	
	Macronymchus glabratus	4	
	Stenelmis sp	1	
	Anopheles sp	13	
	Ablabesmyia sp	13	
	Brillia sp	1	
	Chironomus sp	20	
	Clinotanypus sp	1	
	Corynoneura sp	3	
	Cryptochironomus sp	9	
	Cryptotendipes sp	1	
	Dicrotendipes sp	65	
	Endochironomus sp	43	
	Glyptotendipes sp	87	
	Krenopelopia sp	1	
	Microtendipes sp	1	
	Parakiefferiella sp	1	
	Paratanytarsus sp	2	
	Polypedilum sp	55	
	Procladius sp	47	
	Rheocricotopus sp	5	
	Tanytarsus sp	153	
	Thienemannimyia gr	2	
	Unidentified Chironomid	56	
	Chrysops sp	5	
	Atrichopogon sp	3	
	Probezzia sp	1	
	Unidentified Ceratopogonid	3	
	Unidentified Hydracarina (mite)	10	
	Gammarus sp	2	

	<i>Hyalella azteca</i>	11	
	<i>Lirceus fontinalis</i>	2	
<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/14/00</b>
	<i>Achnanthidium minutissimum</i>	18	
	<i>Amphora ovalis</i> var. <i>affinis</i>	2	
	<i>Amphora perpusilla</i>	2	
	<i>Cocconeis pediculus</i>	1	
	<i>Cocconeis placentula</i> var. <i>lineata</i>	2	
	<i>Cyclotella</i> sp.	2	
	<i>Cyclotella stelligera</i>	2	
	<i>Cymatopleura solea</i>	1	
	<i>Entomoneis ornata</i>	8	
	<i>Fragilaria capucina</i> var. <i>mesolepta</i>	3	
	<i>Gomphonema intricatum</i> var. <i>pulvinatum</i>	4	
	<i>Gomphonema parvulum</i>	18	
	<i>Gomphonema</i> sp.	2	
	<i>Gyrosigma scalpoides</i>	8	
	<i>Gyrosigma spencerii</i> var. <i>curvula</i>	14	
	<i>Luticola mutica</i>	2	
	<i>Melosira ambigua</i>	13	
	<i>Melosira distans</i> var. <i>alpigena</i>	23	
	<i>Navicula arvensis</i>	2	
	<i>Navicula capitatoradiata</i>	4	
	<i>Navicula contenta</i> var. <i>biceps</i>	2	
	<i>Navicula cryptocephala</i>	11	
	<i>Navicula cryptotenella</i>	8	
	<i>Navicula hustedtii</i>	3	
	<i>Navicula minima</i>	2	
	<i>Navicula notha</i>	6	
	<i>Navicula salinarum</i>	2	
	<i>Navicula</i> sp. 13	42	
	<i>Navicula</i> sp. 3	13	
	<i>Navicula</i> sp. 4	2	
	<i>Navicula subminuscula</i>	2	
	<i>Navicula tenelloides</i>	4	
	<i>Navicula trivialis</i>	6	
	<i>Navicula viridula</i> var. <i>linearis</i>	36	
	<i>Nitzschia amphibia</i>	1	
	<i>Nitzschia capitellata</i>	2	
	<i>Nitzschia frustulum</i>	2	
	<i>Nitzschia linearis</i>	4	
	<i>Nitzschia</i> sp.	10	
	<i>Pinnularia</i> sp.	2	
	<i>Planothidium lanceolata</i>	6	
	<i>Rhoicosphenia curvata</i>	2	
	<i>Sellaphora pupula</i>	2	
	<i>Sellaphora pupula</i> var. <i>mutata</i>	2	
	<i>Stichosiphon sansibaricus</i>	45	
	<i>Surirella angustata</i>	2	
	<i>Surirella linearis</i>	1	
	<i>Synedra rumpens</i>	48	
	<i>Synedra rumpens</i> var. <i>familiaris</i>	1	
<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/14/00</b>
	<i>Cryptomonas</i> sp.	1	
	<i>Oedogonium</i> sp.	1	
	<i>Oscillatoria lutea</i>	95	
	<i>Scenedesmus dimorphus</i>	1	



**Station ID:** CRR200005      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** SOUTH FORK LITTLE RIVER  
**County:** CHRISTIAN      **Map Name:** HOPKINSVILLE  
**Catchment Area:** 45.39      **River Mile:** 67.18      **Stream Order:** 4  
**Lat Dec:** 36.85292      **Long Dec:** -87.46967  
**Location:** TRAIL OF TEARS COMMEMORATIVE PARK

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### Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/25/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	1	
Rockbass	<i>Ambloplites rupestris</i>	1	
Longear Sunfish	<i>Lepomis megalotis</i>	11	

### Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/03/00</b>
Unidentified Cambaridae	1	
Unidentified Coenagrionid	1	
Elimia sp	67	
Corbicula fluminea	3	
Unidentified Tubificidae	8	
Stenacron sp	25	
Argia sp	1	
Enallagma sp	8	
Sigara sp	2	
Mesovelia sp	1	
Trepobates sp	1	
Cheumatopsyche sp	3	
Psephenus herricki	2	
Peltodytes sp	1	
Enochrus sp	1	
Dicranota sp	1	
Pilaria sp	1	
Cricotopus/Orthocladius gr	13	
Cryptochironomus sp	2	
Cryptotendipes sp	2	
Helopelopia sp	2	
Microtendipes sp	3	
Paralauterborniella nigrohalteralis	3	
Phaenopsectra sp	3	
Polypedilum sp	8	
Procladius sp	1	
Stenochironomus sp	2	
Tanytarsus sp	2	
Unidentified Chironomid	2	
Culicoides sp	1	
Gammarus sp	10	
Caecidotea sp	6	
Lirceus fontinalis	2	

### Diatoms

<b>Taxa</b>	<b>Individuals</b>	<b>07/03/00</b>
<i>Achnanthes microcephala</i>	2	
<i>Achnanthes</i> sp. 2	2	
<i>Achnanthidium minutissimum</i>	2	
<i>Amphora ovalis</i> var. <i>affinis</i>	6	
<i>Amphora perpusilla</i>	3	
<i>Amphora submontana</i>	1	
<i>Cocconeis pediculus</i>	26	
<i>Cocconeis placentula</i> var. <i>euglypta</i>	30	
<i>Cocconeis placentula</i> var. <i>lineata</i>	26	
<i>Cymatopleura solea</i>	4	

Gomphonema brasiliense	6
Gomphonema parvulum	2
Gyrosigma attenuatum	1
Gyrosigma scalpoides	5
Gyrosigma spencerii	4
Melosira granulata	72
Meridion circulare	1
Navicula cryptocephala	12
Navicula cryptocephala var. veneta	2
Navicula cryptotenella	6
Navicula menisculus	3
Navicula minima	4
Navicula notha	2
Navicula phyllepta	4
Navicula rhynchocephala	2
Navicula rhynchocephala var. germanii	9
Navicula schroeteri var. escambia	10
Navicula sp. 6	4
Navicula sp. 7	2
Navicula sp. 8	2
Navicula tenelloides	14
Navicula tenera	29
Navicula tripunctata	1
Navicula viridula var. linearis	9
Neidium binode	2
Nitzschia denticula	1
Nitzschia dissipata	12
Nitzschia frustulum	8
Nitzschia gracilis	4
Nitzschia palea	3
Nitzschia sigmoidea	2
Nitzschia sp.	8
Nitzschia sp. 2	9
Nitzschia sp. 5	7
Rhoicosphenia curvata	10
Sellaphora pupula	2
Surirella ovata	2
Surirella ovata var. pinnata	11
Synedra ulna	3
Tryblionella tryblionella var. victoriae	2

Non-Diatom Algae	Taxa	Individuals	07/03/00
	Encyonema mesianum	9	
	Oscillatoria sp.	2	
	Schizothrix calcicola	3	
	Schizothrix sp.	3	

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Fishes	Common Name	Scientific Name	Individuals	10/05/00
	Rockbass	<i>Ambloplites rupestris</i>	1	
	Green Sunfish	<i>Lepomis cyanellus</i>	2	
	Longear Sunfish	<i>Lepomis megalotis</i>	9	
	Snubnose Darter	<i>Etheostoma simoterum</i>	1	

Invertebrates	Taxa	Individuals	09/07/00
	Pentacora sp	2	

Unidentified Cambaridae	3
Fossaria sp	3
Elimia sp	84
Menetus dilatatus	2
Sphaerium sp	5
Unidentified Hirudinea	1
Argia sp	28
Enallagma sp	58
Ophiogomphus sp	1
Neurocordulia sp	2
Notonecta sp	1
Rheumatobates sp	1
Anopheles (pupae)	1

Diatoms	Taxa	Individuals	09/07/00
	Achnanthes pusilla	13	
	Achnanthes sp. 2	2	
	Amphora ovalis var. affinis	2	
	Amphora perpusilla	8	
	Amphora submontana	2	
	Cocconeis placentula var. euglypta	26	
	Cocconeis placentula var. lineata	22	
	Cymbella silesiaca	4	
	Cymbella sp.	2	
	Diploneis oblongella	4	
	Gomphonema brasiliense	6	
	Gomphonema parvulum	7	
	Gyrosigma attenuatum	1	
	Gyrosigma scalpoides	6	
	Melosira varians	4	
	Merismopedia punctata	35	
	Navicula atomus	4	
	Navicula auriculata	3	
	Navicula cf. goeppertiana	2	
	Navicula cryptocephala	6	
	Navicula menisculus	2	
	Navicula minima	17	
	Navicula rhynchocephala var. germanii	10	
	Navicula saprophila	8	
	Navicula schadei	8	
	Navicula schroeterii	16	
	Navicula seminulum	3	
	Navicula sp. 12	4	
	Navicula sp. 4	18	
	Navicula subminuscula	6	
	Navicula tenelloides	9	
	Navicula viridula var. rostellata	6	
	Nitzschia amphibia	25	
	Nitzschia debilis	15	
	Nitzschia dissipata	51	
	Nitzschia dubia	1	
	Nitzschia sp.	9	
	Nitzschia sp. 1	3	
	Nitzschia sp. 2	3	
	Nitzschia sp. 4	4	
	Nitzschia vermicularis	4	
	Planothidium lanceolata	3	
	Planothidium lanceolata var. dubia	4	
	Rhoicosphenia curvata	6	
	Rossithidium linearis f. curta	7	

<i>Sellaphora pupula</i>	2
<i>Stephanocyclus meneghiniana</i>	2
<i>Surirella angustata</i>	2
<i>Tryblionella tryblionella</i> var. <i>victoriae</i>	2

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/07/00</b>
	<i>Lemanea</i> cf. <i>fluviatilis</i>	161	
	<i>Nostoc</i> sp.	2	
	<i>Oscillatoria lutea</i>	240	
	<i>Porphyrosiphon splendidus</i>	245	
	<i>Schizothrix calcicola</i>	338	
	<i>Stichosiphon sansibaricus</i>	1000	

**Station ID:** CRR200006      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** NORTH FORK LITTLE RIVER  
**County:** CHRISTIAN      **Map Name:** CHURCH HILL  
**Catchment Area:** 54.2      **River Mile:** 63.58      **Stream Order:** 5  
**Lat Dec:** 36.83155      **Long Dec:** -87.52454  
**Location:** HOPKINSVILLE BYPASS 3495 SOUTH SIDE-200 m UPSTREAM FROM BRIDGE

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### Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/25/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	3	
Bluntnose Minnow	<i>Pimephales notatus</i>	8	
Yellow Bullhead	<i>Ameiurus natalis</i>	3	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	2	
Rockbass	<i>Ambloplites rupestris</i>	2	
Green Sunfish	<i>Lepomis cyanellus</i>	9	
Longear Sunfish	<i>Lepomis megalotis</i>	25	
Largemouth Bass	<i>Micropterus salmoides</i>	1	

### Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/05/00</b>
Unidentified Cambaridae	4	
Elimia sp	163	
Gyraulus parvus	1	
Stenacron sp	8	
Stenonema sp	2	
Unidentified Heptageniid	4	
Argia sp	6	
Macromia sp	1	
Climacia sp	2	
Hydroptila sp	56	
Ceraclea sp	1	
Ancyronyx variegatus	2	
Ancyronyx variegatus	8	
Stenelmis sp	12	
Stenelmis sp	7	
Hemerodromia sp	1	
Ablabesmyia sp	11	
Clinotanypus sp	1	
Cricotopus sp	1	
Cricotopus/Orthocladius gr	9	
Cryptochironomus sp	6	
Dicrotendipes sp	14	
Helopelopia sp	4	
Paratanytarsus sp	21	
Phaenopsectra sp	6	
Polypedilum sp	9	
Procladius sp	1	
Rheotanytarsus sp	3	
Stenochironomus sp	1	
Tanytarsus sp	14	
Thienemanniella sp	2	
Unidentified Chironomid	2	
Xenochironomus sp	2	
Simulium sp	3	

### Diatoms

<b>Taxa</b>	<b>Individuals</b>	<b>07/05/00</b>
<i>Achnanthes hauckiana</i>	8	
<i>Achnanthes</i> sp.	16	
<i>Amphora perpusilla</i>	22	

Chroococcus sp.	1
Cocconeis placentula var. lineata	2
Cyclostephanos dubius	2
Gomphonema brasiliense	2
Gomphonema sp. 4	4
Gyrosigma spencerii	4
Melosira varians	18
Navicula atomus	5
Navicula auriculata	9
Navicula cryptocephala	3
Navicula ingenua	2
Navicula minima	114
Navicula rhynchocephala	8
Navicula schroeteri var. escambia	10
Navicula secreta var. apiculata	12
Navicula seminulum	4
Navicula tantula	2
Navicula tenelloides	2
Navicula tripunctata	13
Navicula trivialis	2
Navicula viridula var. rostellata	2
Nitzschia amphibia	29
Nitzschia dissipata	6
Nitzschia fonticola	4
Nitzschia frustulum	4
Nitzschia gracilis	2
Nitzschia palea	1
Nitzschia perminuta	8
Nitzschia recta	2
Nitzschia sp.	17
Nitzschia sp. 2	8
Nitzschia sp. 3	2
Nitzschia sp. 4	11
Nitzschia sp. 6	4
Placoneis gastrum	4
Planothidium lanceolata	2
Rhoicosphenia curvata	17
Rossithidium linearis f. curta	2
Surirella sp.	5
Synedra parasitica var. subconstricta	2
Synedra rumpens var. familiaris	2

Non-Diatom Algae	Taxa	Individuals	07/05/00
Oscillatoria lutea		2	
Rhodochorton sp.		7	
Schizothrix calcicola		2	

## Fishes

Common Name	Scientific Name	Individuals	10/10/00
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	5	
Yellow Bullhead	<i>Ameiurus natalis</i>	1	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	8	
Western Mosquitofish	<i>Gambusia affinis</i>	16	
Banded Sculpin	<i>Cottus carolinae</i>	1	
Rockbass	<i>Ambloplites rupestris</i>	1	
Green Sunfish	<i>Lepomis cyanellus</i>	3	
Longear Sunfish	<i>Lepomis megalotis</i>	32	
Spotted Bass	<i>Micropterus punctulatus</i>	2	

<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/15/00</b>
	Elimia sp	50	
	Stenacron sp	34	
	Tricorythodes sp	17	
	Baetis sp	38	
	Argia sp	35	
	Calopteryx sp	1	
	Unidentified Corduliid	1	
	Rhagovelia sp	4	
	Corydalus cornutus	2	
	Hydroptila sp	14	
	Oecetis sp	11	
	Cheumatopsyche sp	57	
	Hydropsyche sp	5	
	Peltodytes sp	2	
	Berosus sp(larvae)	5	
	Ancyronyx variegatus	10	
	Stenelmis sp	73	
	Tipula sp	12	
	Hemerodromia sp	1	
	Cladotanytarsus sp	4	
	Cryptochironomus sp	1	
	Paratanytarsus sp	1	
	Polypedilum sp	4	
	Rheotanytarsus sp	7	
	Stempellinella sp	1	
	Stenochironomus sp	1	
	Tanytarsus sp	2	
	Thienemanniella sp	1	
	Thienemannimyia gr	24	
	Simulium sp	1	
	Gammarus sp	5	
	Lirceus fontinalis	29	
<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/15/00</b>
	Achnanthes sp. 2	6	
	Achnanthidium minutissimum	4	
	Cocconeis placentula var. euglypta	20	
	Cocconeis placentula var. lineata	115	
	Gomphonema brasiliense	5	
	Gomphonema intricatum var. pulvinatum	2	
	Gomphonema parvulum	8	
	Gyrosigma scalpoides	2	
	Gyrosigma spencerii var. curvula	2	
	Melosira varians	10	
	Navicula atomus	9	
	Navicula auriculata	20	
	Navicula cryptocephala	3	
	Navicula hustedtii	2	
	Navicula ingenua	3	
	Navicula menisculus	11	
	Navicula minima	24	
	Navicula rhynchocephala var. germanii	4	
	Navicula secreta var. apiculata	8	
	Navicula sp. 10	4	
	Navicula tripunctata	5	
	Navicula viridula	1	
	Navicula viridula var. rostellata	2	

<i>Nitzschia amphibia</i>	14
<i>Nitzschia debilis</i>	21
<i>Nitzschia dissipata</i>	3
<i>Nitzschia frustulum</i>	6
<i>Nitzschia perminuta</i>	7
<i>Nitzschia</i> sp.	6
<i>Nitzschia</i> sp. 6	11
<i>Planothidium lanceolata</i>	1
<i>Reimeria sinuata</i>	1
<i>Rhizoclonium hieroglyphicum</i>	1
<i>Rhoicosphenia curvata</i>	6
<i>Sellaphora pupula</i>	2
<i>Synedra rumpens</i> var. <i>familiaris</i>	4

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/15/00</b>
	<i>Lemanea</i> cf. <i>fluviatilis</i>	24	
	<i>Oscillatoria lutea</i>	3	
	<i>Oscillatoria submembranacea</i>	4	
	<i>Schizothrix calcicola</i>	4	

**Station ID:** CRR200007      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** NORTH FORK LITTLE RIVER  
**County:** CHRISTIAN      **Map Name:** CHURCH HILL  
**Catchment Area:** 58.54      **River Mile:** 58.34      **Stream Order:** 5  
**Lat Dec:** 36.80178      **Long Dec:** -87.51382  
**Location:** 107 TO GRAY LANE-JUST BELOW WASTE WATER TREATMENT PLANT

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## Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/26/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	12	
Striped Shiner	<i>Luxilus chrysocephalus</i>	1	
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	2	
Northern Hogsucker	<i>Hypentelium nigricans</i>	1	
Banded Sculpin	<i>Cottus carolinae</i>	1	
Rockbass	<i>Ambloplites rupestris</i>	7	
Green Sunfish	<i>Lepomis cyanellus</i>	2	
Bluegill	<i>Lepomis macrochirus</i>	1	
Longear Sunfish	<i>Lepomis megalotis</i>	4	
Greenside Darter	<i>Etheostoma blennioides</i>	2	
Snubnose Darter	<i>Etheostoma simoterum</i>	1	

<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/05/00</b>
Dubiraphia sp (adult)		3	
Elimia sp		13	
Corbicula fluminea		1	
Caenis sp		1	
Argia sp		8	
Climacia sp		9	
Hydroptila sp		6	
Cheumatopsyche sp		4	
Ancyronyx variegatus		1	
Ancyronyx variegatus		8	
Dubiraphia sp (larvae)		2	
Stenelmis sp		6	
Stenelmis sp		6	
Ablabesmyia sp		6	
Chironomus sp		1	
Cryptochironomus sp		4	
Dicrotendipes sp		1	
Glyptotendipes sp		1	
Krenopelopia sp		1	
Paratanytarsus sp		2	
Phaenopsectra sp		7	
Polypedilum sp		7	
Procladius sp		4	
Stempellinella sp		5	
Stenochironomus sp		3	
Tanytarsus sp		3	
Thienemannimyia gr		2	
Tribelos sp		8	
Unidentified Chironomid		14	
Unidentified Hydracarina (mite)		1	
Caecidotea sp		2	

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/05/00</b>
	<i>Achnanthidium minutissimum</i>	5	
	<i>Amphora perpusilla</i>	19	

Cocconeis pediculus	4
Cocconeis placentula var. euglypta	5
Cyclostephanos dubius	3
Cyclotella stelligera	1
Cymbella tumida	1
Gomphonema intricatum var. pulvinatum	5
Gomphonema parvulum	4
Gyrosigma scalproides	1
Gyrosigma spencerii	2
Melosira varians	13
Navicula atomus	4
Navicula cf. goeppertiana	6
Navicula menisculus	109
Navicula saprophila	4
Navicula schroeterii	3
Navicula seminulum	2
Navicula sp. 14	4
Navicula sp. 9a	5
Navicula subminuscula	52
Navicula tenelloides	3
Navicula tripunctata	2
Navicula trivialis	7
Nitzschia amphibia	12
Nitzschia dissipata	11
Nitzschia frustulum	2
Nitzschia sp.	18
Nitzschia sp. 5	2
Planothidium lanceolata	5
Planothidium lanceolata var. dubia	3
Reimeria sinuata	4
Rhoicosphenia curvata	20
Surirella ovata	2

Non-Diatom Algae	Taxa	Individuals	07/05/00
	Oscillatoria lutea	2	
	Schizothrix calcicola	1	

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### Fishes

Common Name	Scientific Name	Individuals	10/10/00
Largescale Stoneroller	<i>Campostoma oligolepis</i>	2	
Striped Shiner	<i>Luxilus chryscephalus</i>	4	
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	36	
Bluntnose Minnow	<i>Pimephales notatus</i>	5	
Northern Hogsucker	<i>Hypentelium nigricans</i>	1	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	3	
Banded Sculpin	<i>Cottus carolinae</i>	5	
Rockbass	<i>Ambloplites rupestris</i>	1	
Redbreast Sunfish	<i>Lepomis auritus</i>	1	
Longear Sunfish	<i>Lepomis megalotis</i>	13	
Spotted Bass	<i>Micropterus punctulatus</i>	1	
Greenside Darter	<i>Etheostoma blennioides</i>	1	
Fringed Darter	<i>Etheostoma crossopterum</i>	1	

Invertebrates	Taxa	Individuals	09/15/00
	Dubiraphia sp (adult)	15	
	Labrundinia sp	1	

Elimia sp	32
Unidentified Tubificidae	5
Stenacron sp	5
Unidentified Heptageniid	1
Procloeon sp	1
Argia sp	14
Enallagma sp	41
Cheumatopsyche sp	1
Berosus sp(larvae)	1
Ancyronyx variegatus	1
Ancyronyx variegatus	2
Dubiraphia sp (larvae)	8
Stenelmis sp	2
Stenelmis sp	9
Ablabesmyia sp	9
Cladotanytarsus sp	2
Dicrotendipes sp	1
Polypedilum sp	7
Procladius sp	1
Stenochironomus sp	1
Tanytarsus sp	7
Tribelos sp	5
Gammarus sp	2
Caecidotea sp	1

Diatoms	Taxa	Individuals	09/15/00
	Achnanthes hauckiana	8	
	Achnanthes sp. 2	2	
	Achnanthidium minutissimum	11	
	Caloneis bacillum	2	
	Coccconeis pediculus	2	
	Coccconeis placentula var. euglypta	8	
	Coccconeis placentula var. lineata	22	
	Cyclostephanos dubius	4	
	Cyclotella sp.	2	
	Gomphonema affine	2	
	Gomphonema angustatum	2	
	Gomphonema brasiliense	20	
	Gomphonema parvulum	4	
	Melosira varians	32	
	Meridion circulare	2	
	Navicula auriculata	14	
	Navicula hustedtii	6	
	Navicula ingenua	7	
	Navicula menisculus	4	
	Navicula minima	75	
	Navicula rhynchocephala var. germanii	4	
	Navicula secreta var. apiculata	8	
	Navicula sp.	2	
	Navicula sp. 1	4	
	Navicula sp. 10	16	
	Navicula sp. 4	4	
	Navicula tenelloides	6	
	Navicula tripunctata	24	
	Neidium binode	4	
	Nitzschia amphibia	9	
	Nitzschia debilis	16	
	Nitzschia dissipata	29	
	Nitzschia frustulum	5	
	Nitzschia hungarica	4	

<i>Nitzschia linearis</i>	2
<i>Nitzschia</i> sp. 6	8
<i>Planothidium lanceolata</i>	2
<i>Rhoicosphenia curvata</i>	18
<i>Sellaphora pupula</i>	2
<i>Stichosiphon sansibaricus</i>	34
<i>Surirella ovata</i>	2
<i>Surirella ovata</i> var. <i>pinnata</i>	2

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/15/00</b>
	<i>Characium pringsheimii</i>	20	
	<i>Pithophora kewensis</i>	1000	
	<i>Schizothrix calcicola</i>	32	
	<i>Schizothrix</i> sp.	1	
	<i>Ulothrix</i> sp.	120	

**Station ID:** CRR200008      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** NORTH FORK LITTLE RIVER  
**County:** CHRISTIAN      **Map Name:** CHURCH HILL  
**Catchment Area:** 46.16      **River Mile:** 67.00      **Stream Order:** 5  
**Lat Dec:** 36.86183      **Long Dec:** -87.51936  
**Location:** 272 W. SIDE HOPKINSVILLE-200 M UPSTREAM FROM BRIDGE

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### Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/25/00</b>
Common Carp	<i>Cyprinus carpio</i>	2	
Yellow Bullhead	<i>Ameiurus natalis</i>	2	
Channel Catfish	<i>Ictalurus punctatus</i>	1	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	2	
Redbreast Sunfish	<i>Lepomis auritus</i>	2	
Green Sunfish	<i>Lepomis cyanellus</i>	3	
Longear Sunfish	<i>Lepomis megalotis</i>	9	

### Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/03/00</b>
Elimia sp	136	
Argia sp	2	
Rheumatobates sp	1	
Hydroptila sp	3	
Cheumatopsyche sp	13	
Unidentified Curculionid	1	
Stenelmis sp	1	
Cricotopus/Orthocladius gr	1	
Cryptochironomus sp	4	
Dicrotendipes sp	3	
Krenopelopia sp	1	
Phaenopsectra sp	1	
Polypedilum sp	12	
Procladius sp	1	
Thienemannimyia gr	1	
Unidentified Chironomid	2	
Simulium sp	2	

### Diatoms

<b>Taxa</b>	<b>Individuals</b>	<b>07/03/00</b>
<i>Achnanthes hauckiana</i>	6	
<i>Achnanthidium minutissimum</i>	4	
<i>Amphora ovalis</i> var. <i>pediculus</i>	6	
<i>Amphora perpusilla</i>	2	
<i>Caloneis hyalina</i>	2	
<i>Cocconeis placentula</i> var. <i>euglypta</i>	11	
<i>Cocconeis placentula</i> var. <i>lineata</i>	8	
<i>Cymbella silesiaca</i>	2	
<i>Entomoneis ornata</i>	2	
<i>Gomphonema brasiliense</i>	73	
<i>Gomphonema parvulum</i>	24	
<i>Gyrosigma attenuatum</i>	4	
<i>Gyrosigma scalpoides</i>	2	
<i>Melosira varians</i>	7	
<i>Navicula auriculata</i>	8	
<i>Navicula cryptotenella</i>	2	
<i>Navicula hustedtii</i>	2	
<i>Navicula menisculus</i>	6	
<i>Navicula minima</i>	62	
<i>Navicula rhynchocephala</i> var. <i>germanii</i>	1	
<i>Navicula schadei</i>	2	
<i>Navicula schmassmannii</i>	7	

Navicula secreta var. apiculata	5
Navicula seminulum	2
Navicula sp.	2
Navicula sp. 10	10
Navicula subminuscula	2
Navicula tenelloides	13
Navicula tripunctata	20
Neidium binode	2
Nitzschia amphibia	13
Nitzschia apiculata	5
Nitzschia dissipata	15
Nitzschia gracilis	12
Nitzschia sp.	10
Pinnularia biceps	2
Porphyrosiphon notorisii	1
Reimeria sinuata	2
Rhoicosphenia curvata	22
Sellaphora pupula	2
Stauroneis smithii	4
Surirella ovata var. pinnata	6
Surirella sp.	2

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/03/00</b>
	Cladophora sp.	1000	
	Merismopedia punctata	1	
	Oscillatoria lutea	6	
	Schizothrix arenaria	2	
	Schizothrix calcicola	1	
	Stichosiphon sansibaricus	2	

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### Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>10/10/00</b>
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	1	
Bluntnose Minnow	<i>Pimephales notatus</i>	1	
Creek Chubsucker	<i>Erimyzon oblongus</i>	1	
Yellow Bullhead	<i>Ameiurus natalis</i>	1	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	6	
Western Mosquitofish	<i>Gambusia affinis</i>	1	
Green Sunfish	<i>Lepomis cyanellus</i>	2	
Longear Sunfish	<i>Lepomis megalotis</i>	27	
Fringed Darter	<i>Etheostoma crossopterum</i>	1	

<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/07/00</b>
	Dubiraphia sp (adult)	1	
	Amnicola sp	2	
	Physella sp	7	
	Elimia sp	85	
	Corbicula fluminea	11	
	Unidentified Lumbriculid	3	
	Branchiura sowerbyi	1	
	Unidentified Tubificidae	3	
	Unidentified Heptageniid	2	
	Argia sp	11	
	Enallagma sp	60	
	Dromogomphus sp	3	
	Epitheca (Epicordulia) sp	6	
	Macromia sp	1	
	Rheumatobates sp	2	

Hydroptila sp	100
Oecetis sp	2
Cyphon sp	1
Berosus sp(larvae)	3
Ancyronyx variegatus	1
Stenelmis sp	4
Anopheles sp	1
Ablabesmyia sp	15
Corynoneura sp	1
Dicrotendipes sp	2
Krenopelopia sp	1
Phaenopsectra sp	1
Polypedilum sp	9
Procladius sp	4
Rheotanytarsus sp	8
Stempellina sp	1
Thienemannimyia gr	5
Unidentified Chironomid	1

Diatoms	Taxa	Individuals	09/07/00
	Achnanthes sp. 2	4	
	Achnanthidium minutissimum	7	
	Amphora perpusilla	2	
	Caloneis bacillum	2	
	Closterium eboracense	2	
	Cocconeis placentula var. euglypta	1	
	Cymbella silesiaca	19	
	Cymbella triangulum	2	
	Frustulia vulgaris	4	
	Gomphonema angustatum	8	
	Gomphonema parvulum	28	
	Gyrosigma spencerii var. curvula	2	
	Hippodonta capitata	2	
	Melosira granulata	28	
	Meridion circulare	11	
	Navicula absoluta	2	
	Navicula auriculata	2	
	Navicula cryptocephala	17	
	Navicula menisculus var. upsaliensis	8	
	Navicula minima	8	
	Navicula rhynchocephala var. germanii	4	
	Navicula secreta var. apiculata	12	
	Navicula sp. 10	2	
	Navicula trivialis	2	
	Navicula viridula var. linearis	2	
	Nitzschia amphibia	12	
	Nitzschia capitellata	2	
	Nitzschia dissipata	4	
	Nitzschia linearis	26	
	Nitzschia lorenziana var. subtilis	2	
	Nitzschia sp.	49	
	Nitzschia vermicularis	1	
	Planothidium lanceolata	32	
	Porphyrosiphon notorisii	3	
	Rhoicosphenia curvata	13	
	Rossithidium linearis	9	
	Sellaphora pupula	2	
	Stephanocyclus meneghiniana	3	
	Surirella angustata	14	
	Surirella ovalis	13	

<i>Surirella ovata</i>	2
<i>Surirella ovata</i> var. <i>pinnata</i>	18
<i>Synedra ulna</i>	2
<i>Tryblionella tryblionella</i> var. <i>victoriae</i>	4

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/07/00</b>
	<i>Cladophora</i> sp.	1000	
	<i>Oedogonium</i> sp.	1	
	<i>Oscillatoria</i> sp.	8	
	<i>Pithophora kewensis</i>	1000	
	<i>Schizothrix calcicola</i>	7	
	<i>Stichosiphon sansibaricus</i>	50	

**Station ID:** CRR200009      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** LITTLE RIVER  
**County:** CHRISTIAN      **Map Name:** CHURCH HILL  
**Catchment Area:** 126.64      **River Mile:** 53.48      **Stream Order:** 5  
**Lat Dec:** 36.78336      **Long Dec:** -87.54604  
**Location:** HUFFMAN MILL RD.-AT OLD DAM, DOWNSTREAM FROM BRIDGE

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## Fishes

Site was too deep to sample

Invertebrates	Taxa	Individuals	06/29/00
	Dubiraphia sp (adult)	2	
	Stenonema sp	1	
	Argia sp	1	
	Hagenius brevistylus	1	
	Hydroptila sp	6	
	Triaenodes sp	1	
	Cheumatopsyche sp	17	
	Hydropsyche sp	18	
	Ancyronyx variegatus	1	
	Ancyronyx variegatus	1	
	Dubiraphia sp (larvae)	1	
	Macronychus glabratus	1	
	Stenelmis sp	5	
	Stenelmis sp	1	
	Ablabesmyia sp	1	
	Cryptochironomus sp	1	
	Dicrotendipes sp	4	
	Phaenopsectra sp	1	
	Polypedilum sp	13	
	Rheotanytarsus sp	1	
	Tanytarsus sp	1	
	Thienemannimyia gr	3	
	Unidentified Chironomid	3	

Diatoms	Taxa	Individuals	06/29/00
	Achnanthes pusilla	2	
	Amphora perpusilla	2	
	Cocconeis pediculus	4	
	Cocconeis placentula var. euglypta	10	
	Cocconeis placentula var. lineata	108	
	Cyclotella pseudostelligera	4	
	Gomphonema intricatum var. pulvinatum	4	
	Luticola mutica	2	
	Melosira varians	13	
	Navicula cryptocephala	2	
	Navicula cryptocephala var. veneta	2	
	Navicula cryptotenella	6	
	Navicula minima	133	
	Navicula pseudoreinhundtii	6	
	Navicula rhynchocephala var. germanii	2	
	Navicula saprophila	12	
	Navicula secreta var. apiculata	8	
	Navicula sp. 15	51	
	Navicula sp. 9a	4	
	Navicula subminuscula	40	
	Navicula tenelloides	10	
	Navicula tripunctata	18	
	Nitzschia amphibia	20	

Nitzschia dissipata	1
Nitzschia frustulum	4
Nitzschia sp.	16
Planothidium lanceolata	4
Planothidium lanceolata var. dubia	2
Rhizoclonium hieroglyphicum	7
Rhoicosphenia curvata	45
Tryblionella tryblionella var. victoriae	2

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>06/29/00</b>
	Schizothrix calcicola	7	
	Schizothrix sp.	5	

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## Fishes

Site was too deep to sample

<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/15/00</b>
	Pentacora sp	3	
	Unidentified Isotomid	1	
	Physella sp	17	
	Elimia sp	209	
	Corbicula fluminea	2	
	Stenacron sp	19	
	Stenonema sp	5	
	Tricorythodes sp	350	
	Baetis sp	46	
	Procloeon sp	4	
	Argia sp	55	
	Enallagma sp	14	
	Calopteryx sp	1	
	Dromogomphus sp	3	
	Hagenius sp	1	
	Unidentified Corixid	1	
	Microvelia sp	1	
	Rhagovelia sp	1	
	Neoplea striola	1	
	Belostoma sp	1	
	Hydroptila sp	33	
	Oecetis sp	26	
	Triaenodes sp	7	
	Micrasema sp	35	
	Cheumatopsyche sp	38	
	Hydropsyche sp	89	
	Psephenus herricki	36	
	Elodes sp	1	
	Helophorus sp	1	
	Berosus sp(larvae)	7	
	Ancyronyx variegatus	4	
	Ancyronyx variegatus	21	
	Macronychus glabratus	21	
	Macronychus glabratus	46	
	Stenelmis sp	137	
	Stenelmis sp	22	
	Tipula sp	5	
	Atherix sp	1	
	Ablabesmyia sp	6	
	Corynoneura sp	2	
	Cricotopus/Orthocladius gr	1	

Cryptochironomus sp	4
Dicrotendipes sp	8
Nilotanypus sp	3
Phaenopsectra sp	3
Polypedilum sp	52
Rheocricotopus sp	96
Stempellinella sp	4
Stenochironomus sp	1
Tanytarsus sp	20
Thienemannimyia gr	20
Unidentified Chironomid	3
Simulium sp	10
Unidentified Simuliid	1
Gammarus sp	21
Caecidotea sp	15

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/15/00</b>
	Achnanthes exigua	4	
	Achnanthes sp. 2	4	
	Achnanthidium minutissimum	2	
	Cocconeis placentula var. euglypta	5	
	Cocconeis placentula var. lineata	36	
	Cymbella affinis	2	
	Gomphonema clavatum var. mexicanum	2	
	Gomphonema parvulum	4	
	Navicula atomus	83	
	Navicula auriculata	6	
	Navicula cryptotenella	2	
	Navicula minima	79	
	Navicula saxophila	2	
	Navicula sp. 14	51	
	Nitzschia amphibia	61	
	Nitzschia frustulum	2	
	Nitzschia gracilis	2	
	Nitzschia sp.	37	
	Rhoicosphenia curvata	2	
	Rossithidium linearis f. curta	8	
<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/15/00</b>
	Chroococcus sp.	8	
	Cladophora sp.	1	
	Lemanea cf. fluviatilis	4	
	Mougeotia sp.	2	
	Oscillatoria lutea	6	
	Rhodochorton sp.	2	
	Schizothrix calcicola	7	
	Stichosiphon sansibaricus	2	

**Station ID:** CRR200010      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** SINKING FORK  
**County:** CHRISTIAN      **Map Name:** PLEASANT GREEN HILL  
**Catchment Area:** 16.64      **River Mile:** 30.39      **Stream Order:** 4  
**Lat Dec:** 36.91603      **Long Dec:** -87.57668  
**Location:** S.R. 91-PRINCETON @ BRIDGE

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## Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/25/00</b>
Striped Shiner	<i>Luxilus chryscephalus</i>	2	
White Sucker	<i>Catostomus commersoni</i>	1	
Creek Chubsucker	<i>Erimyzon oblongus</i>	2	
Yellow Bullhead	<i>Ameiurus natalis</i>	2	
Pirate Perch	<i>Aphredoderus sayanus</i>	9	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	2	
Green Sunfish	<i>Lepomis cyanellus</i>	3	
Warmouth	<i>Lepomis gulosus</i>	3	
Longear Sunfish	<i>Lepomis megalotis</i>	3	
Largemouth Bass	<i>Micropterus salmoides</i>	1	
Fringed Darter	<i>Etheostoma crossopterum</i>	7	
Blackside Darter	<i>Percina maculata</i>	1	

## Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/07/00</b>
Dubiraphia sp (adult)	4	
Heterosternuta sp	12	
Pentacora sp	1	
Unidentified Cambaridae	2	
Unidentified Isotomid	9	
Physella sp	13	
Elimia sp	303	
Gyraulus parvus	1	
Sphaerium sp	1	
Unidentified Lumbriculid	1	
Argia sp	1	
Boyeria vinosa	2	
Neoperla sp	6	
Sigara sp	13	
Trichocorixa sp	1	
Microvelia sp	6	
Hydrometra sp	1	
Gerris sp	1	
Hydroptila sp	5	
Triaenodes sp	3	
Cheumatopsyche sp	69	
Ectopria sp larva	1	
Peltodytes sp	6	
Cyphon sp	8	
Laccobius sp	1	
Hydroporus sp	1	
Neoporush sp	4	
Dubiraphia sp (larvae)	1	
Stenelmis sp	1	
Corynoneura sp	1	
Helopelopia sp	20	
Microspectra sp	1	
Microtendipes sp	5	
Parametriocnemus sp	1	
Phaenopsectra sp	2	

Polypedilum sp	37
Pseudochironomus sp	1
Rheocricotopus sp	2
Rheotanytarsus sp	7
Stictochironomus sp	10
Tanytarsus sp	1
Thienemanniella sp	3
Unidentified Chironomid	1
Unidentified Pupae	1
Caecidotea sp	21

Diatoms	Taxa	Individuals	07/07/00
	Achnanthidium minutissimum	3	
	Amphora perpusilla	4	
	Caloneis hyalina	4	
	Cocconeis pediculus	56	
	Cocconeis placentula var. euglypta	57	
	Cocconeis placentula var. lineata	24	
	Gomphonema parvulum	11	
	Gyrosigma scalproides	2	
	Melosira varians	2	
	Merismopedia punctata	1	
	Mougeotia sp.	1000	
	Navicula menisculus	2	
	Navicula minima	12	
	Navicula subminuscula	4	
	Navicula viridula	4	
	Nitzschia amphibia	28	
	Nitzschia dissipata	2	
	Nitzschia perminuta	2	
	Planothidium lanceolata	1	
	Planothidium lanceolata var. dubia	4	
	Rhoicosphenia curvata	143	
	Surirella angustata	4	

Non-Diatom Algae	Taxa	Individuals	07/07/00
	Chamaesiphon incrustans	1000	
	Oscillatoria lutea	5	
	Rhodochorton sp.	9	
	Schizothrix calcicola	1000	

## Fishes

Common Name	Scientific Name	Individuals	10/10/00
Largescale Stoneroller	<i>Campostoma oligolepis</i>	6	
Striped Shiner	<i>Luxilus chrysocephalus</i>	8	
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	38	
Bluntnose Minnow	<i>Pimephales notatus</i>	29	
Creek Chub	<i>Semotilus atromaculatus</i>	1	
White Sucker	<i>Catostomus commersoni</i>	1	
Creek Chubsucker	<i>Erimyzon oblongus</i>	9	
Yellow Bullhead	<i>Ameiurus natalis</i>	1	
Pirate Perch	<i>Aphredoderus sayanus</i>	11	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	8	
Green Sunfish	<i>Lepomis cyanellus</i>	4	
Warmouth	<i>Lepomis gulosus</i>	2	

Bluegill	<i>Lepomis macrochirus</i>	2
Longear Sunfish	<i>Lepomis megalotis</i>	2
Largemouth Bass	<i>Micropterus salmoides</i>	1
Fringed Darter	<i>Etheostoma crossopterum</i>	54
Slabrock Darter	<i>Etheostoma smithi</i>	8

Invertebrates	Taxa	Individuals	09/14/00
	Dubiraphia sp (adult)	1	
	Psychoda sp	1	
	Unidentified Cambaridae	1	
	Pseudosuccinea columella	2	
	Physella sp	2	
	Elimia sp	50	
	Pisidium sp	1	
	Sphaerium sp	15	
	Choroterpes sp	7	
	Stenonema sp	21	
	Caenis sp	46	
	Acerpenna sp	4	
	Enallagma sp	4	
	Calopteryx sp	2	
	Ophiogomphus sp	2	
	Unidentified Corixid	1	
	Microvelia sp	12	
	Trepobates sp	1	
	Hydroptila sp	3	
	Triaenodes sp	7	
	Cheumatopsyche sp	1500	
	Chimarra sp	13	
	Ectopria sp larva	4	
	Peltodytes sp	2	
	Cyphon sp	11	
	Helophorus sp	1	
	Dubiraphia sp (larvae)	14	
	Macronychus glabratus	23	
	Stenelmis sp	1	
	Stenelmis sp	6	
	Limonia sp	3	
	Limonia sp	3	
	Tipula sp	6	
	Hemerodromia sp	1	
	Hemerodromia sp	2	
	Ablabesmyia sp	3	
	Chironomus sp	1	
	Corynoneura sp	23	
	Cricotopus/Orthocladius gr	2	
	Cryptochironomus sp	3	
	Dicrotendipes sp	3	
	Monopelopia sp	35	
	Nanocladius sp	3	
	Parametriocnemus sp	32	
	Paratanytarsus sp	8	
	Paratendipes sp	7	
	Phaenopsectra sp	11	
	Phaenopsectra/Tribelos sp	6	
	Polypedilum sp	618	
	Rheocricotopus sp	15	
	Rheotanytarsus sp	49	
	Stempellina sp	7	

Stenochironomus sp	3
Stictochironomus sp	2
Tanytarsus sp	144
Thienemannimyia gr	130
Unidentified Chironomid	48
Unidentified Larvae	1
Maruina sp	2
Chrysops sp	1
Caecidotea sp	7
Lirceus fontinalis	6

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/14/00</b>
	Achnanthidium minutissimum	3	
	Amphora perpusilla	4	
	Caloneis hyalina	4	
	Cocconeis pediculus	56	
	Cocconeis placentula var. euglypta	57	
	Cocconeis placentula var. lineata	24	
	Gomphonema parvulum	11	
	Gyrosigma scalpoides	2	
	Melosira varians	2	
	Navicula menisculus	2	
	Navicula minima	12	
	Navicula subminuscula	4	
	Navicula viridula	4	
	Nitzschia amphibia	28	
	Nitzschia dissipata	2	
	Nitzschia perminuta	2	
	Planothidium lanceolata	1	
	Planothidium lanceolata var. dubia	4	
	Rhoicosphenia curvata	143	
	Surirella angustata	4	

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/14/00</b>
	Chamaesiphon incrustans	1000	
	Merismopedia punctata	1	
	Mougeotia sp.	1000	
	Oscillatoria lutea	5	
	Rhodochorton sp.	9	
	Schizothrix calcicola	1000	

**Station ID:** CRR200011      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** SINKING FORK  
**County:** CHRISTIAN      **Map Name:** PLEASANT GREEN HILL  
**Catchment Area:** 30.14      **River Mile:** 14.15      **Stream Order:** 4  
**Lat Dec:** 36.8812      **Long Dec:** -87.60839  
**Location:** HWY 68-SAMPLE BEHIND OLD GREY CHURCH-200 M BELOW 68-80 BRIDGE

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## Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/25/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	2	
Striped Shiner	<i>Luxilus chrysocephalus</i>	32	
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	11	
Bluntnose Minnow	<i>Pimephales notatus</i>	14	
Creek Chub	<i>Semotilus atromaculatus</i>	5	
Yellow Bullhead	<i>Ameiurus natalis</i>	4	
Pirate Perch	<i>Aphredoderus sayanus</i>	4	
Blackspotted Topminnow	<i>Fundulus olivaceus</i>	2	
Banded Sculpin	<i>Cottus carolinae</i>	10	
Warmouth	<i>Lepomis gulosus</i>	1	
Longear Sunfish	<i>Lepomis megalotis</i>	10	
Largemouth Bass	<i>Micropterus salmoides</i>	1	
Fringed Darter	<i>Etheostoma crossopterum</i>	7	
Snubnose Darter	<i>Etheostoma simoterum</i>	1	

## Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/07/00</b>
Dubiraphia sp (adult)	6	
Unidentified Cambaridae	1	
Physella sp	2	
Sphaerium sp	50	
Corbicula fluminea	1	
Stenacron sp	5	
Boyeria vinoso	1	
Somatochlora sp	3	
Unidentified Corduliid	1	
Unidentified Libellulid	1	
Trepobates sp	1	
Sialis sp	3	
Ceraclea sp	1	
Triaenodes sp	1	
Peltodytes sp	1	
Peltodytes sp	4	
Cyphon sp	3	
Stenelmis sp	3	
Stenelmis sp	1	
Axarus sp	1	
Chironomus sp	1	
Harnischia sp	1	
Krenopelopia sp	1	
Microtendipes sp	1	
Phaenopsectra sp	1	
Procladius sp	1	
Stenochironomus sp	1	
Stictochironomus sp	30	
Thienemannimyia gr	1	
Unidentified Hydracarina (mite)	15	
Hyalella azteca	19	
Caecidotea sp	6	

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/07/00</b>
	<i>Achnanthes pusilla</i>	6	
	<i>Achnanthidium minutissimum</i>	10	
	<i>Amphora perpusilla</i>	4	
	<i>Cocconeis pediculus</i>	209	
	<i>Cocconeis placentula</i> var. <i>euglypta</i>	15	
	<i>Cymbella</i> sp.	8	
	<i>Gomphonema intricatum</i> var. <i>pulvinatum</i>	2	
	<i>Gomphonema parvulum</i>	18	
	<i>Gomphonema</i> sp.	6	
	<i>Gyrosigma scalproides</i>	2	
	<i>Karayevia clevei</i>	2	
	<i>Meridion circulare</i>	2	
	<i>Navicula clementis</i>	2	
	<i>Navicula cryptocephala</i>	2	
	<i>Navicula menisculus</i>	2	
	<i>Navicula minima</i>	8	
	<i>Navicula penpusilla</i>	2	
	<i>Navicula subminuscula</i>	4	
	<i>Navicula viridula</i> var. <i>rostellata</i>	2	
	<i>Nitzschia amphibia</i>	12	
	<i>Nitzschia frustulum</i>	4	
	<i>Nitzschia parvula</i>	2	
	<i>Nitzschia</i> sp. 4	2	
	<i>Rhizoclonium hieroglyphicum</i>	1000	
	<i>Rhoicosphenia curvata</i>	67	
<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/07/00</b>
	<i>Oedogonium</i> sp.	11	
	<i>Oscillatoria lutea</i>	2	
	<i>Schizothrix calcicola</i>	1000	

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<b>Fishes</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>10/10/00</b>
	Rosefin Shiner	<i>Lythrurus fasciolaris</i>	3	
	Bluntnose Minnow	<i>Pimephales notatus</i>	7	
	Creek Chubsucker	<i>Erimyzon oblongus</i>	2	
	Pirate Perch	<i>Aphredoderus sayanus</i>	1	
	Blackspotted Topminnow	<i>Fundulus olivaceus</i>	15	
	Western Mosquitofish	<i>Gambusia affinis</i>	1	
	Banded Sculpin	<i>Cottus carolinae</i>	2	
	Green Sunfish	<i>Lepomis cyanellus</i>	1	
	Longear Sunfish	<i>Lepomis megalotis</i>	27	
	Fringed Darter	<i>Etheostoma crossopterum</i>	19	
<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/07/00</b>	
	Dubiraphia sp (adult)	25		
	Pentacora sp	1		
	Unidentified Isotomid	2		
	Fossaria sp	2		
	Physella sp	2		
	Elimia sp	80		
	Sphaerium sp	11		
	Branchiura sowerbyi	2		
	Limnodrilus sp	1		
	Unidentified Tubificidae	4		
	Choroterpes sp	5		

Stenacron sp	6
Stenonema sp	25
Caenis sp	5
Procloeon sp	2
Argia sp	2
Enallagma sp	2
Boyeria vinoso	1
Pachydiplex longipennis	1
Somatochlora sp	6
Microvelia sp	1
Ranatra sp	1
Rheumatobates sp	1
Sialis sp	3
Hydroptila sp	5
Oecetis sp	2
Triaenodes sp	1
Ectopia sp larva	2
Peltodytes sp	15
Cyphon sp	2
Berosus sp(larvae)	2
Enochrus sp	2
Laccobius sp	1
Gyrinus sp	1
Hydroporus sp	1
Dubiraphia sp (larvae)	11
Stenelmis sp	2
Stenelmis sp	8
Anopheles sp	2
Ablabesmyia sp	2
Glyptotendipes sp	1
Goeldichironomus holoprasinus	1
Microtendipes sp	1
Parachironomus sp	1
Phaenopsectra sp	2
Polypedilum sp	4
Pothastia sp	1
Stempellinella sp	8
Tanytarsus sp	2
Thienemannimyia gr	2
Stratiomys sp	5
Hyalella azteca	12
Caecidotea sp	40

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/07/00</b>
	Achnanthes biasolettiana	2	
	Achnanthes pusilla	6	
	Achnanthidium minutissimum	2	
	Amphora perpusilla	8	
	Amphora submontana	2	
	Cocconeis pediculus	91	
	Cocconeis placentula var. euglypta	5	
	Cocconeis placentula var. lineata	2	
	Cyclotella pseudostelligera	2	
	Diadesmis confervacea	233	
	Gomphonema parvulum	6	
	Gomphonema sphaerophorum	4	
	Melosira varians	3	
	Merismopedia punctata	1	
	Mougeotia sp.	1000	
	Navicula cryptocephala	3	

Navicula cryptotenella	5
Navicula menisculus	4
Navicula minima	50
Navicula rhynchocephala var. germanii	6
Navicula salinarum	10
Navicula saprophila	2
Navicula schadei	4
Navicula tenelloides	28
Nitzschia dissipata	2
Nitzschia frustulum	14
Nitzschia palea	2
Nitzschia sp.	2
Nitzschia sp. 4	6
Nitzschia vermicularis	2
Planothidium lanceolata var. dubia	2
Rhoicosphenia curvata	4
Sellaphora pupula	2
Surirella linearis	2
Synedra ulna	2

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/07/00</b>
	Chamaesiphon incrassans	9	
	Characium pringsheimii	1000	
	Nostoc sp.	3	
	Oedogonium sp.	24	
	Porphyrosiphon splendidus	5	
	Schizothrix arenaria	1000	
	Schizothrix calcicola	6	

**Station ID:** CRR200012      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** LITTLE RIVER  
**County:** CHRISTIAN      **Map Name:** CHURCH HILL  
**Catchment Area:** 129.64      **River Mile:** 50.63      **Stream Order:** 5  
**Lat Dec:** 36.76038      **Long Dec:** -87.5501  
**Location:** 117 TO STRIPED BRIDGE RD

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## Fishes

Site was too deep to sample

Invertebrates	Taxa	Individuals	07/12/00
	Dubiraphia sp (adult)	42	
	Unidentified Coenagrionid	3	
	Elimia sp	318	
	Corbicula fluminea	3	
	Pristina sp	31	
	Branchiura sowerbyi	1	
	Unidentified Tubificidae	4	
	Stenacron sp	3	
	Stenonema sp	2	
	Unidentified Heptageniid	12	
	Baetis sp	45	
	Argia sp	16	
	Microvelia sp	5	
	Mesovelia sp	1	
	Unidentified Gerrid	1	
	Climacia sp	1	
	Hydroptila sp	26	
	Ceraclea sp	1	
	Triaenodes sp	8	
	Micrasema sp	22	
	Cheumatopsyche sp	58	
	Hydropsyche sp	245	
	Cernotina sp	1	
	Psephenus herricki	9	
	Psephenus herricki	23	
	Cyphon sp	7	
	Berosus sp A	18	
	Unidentified Curculionid	1	
	Ancyronyx variegatus	2	
	Ancyronyx variegatus	7	
	Macronychus glabratus	32	
	Macronychus glabratus	138	
	Stenelmis sp	91	
	Stenelmis sp	47	
	Anopheles sp	2	
	Pseudolimnophila sp	1	
	Tipula sp	8	
	Ablabesmyia sp	1	
	Cladotanytarsus sp	2	
	Corynoneura sp	3	
	Cricotopus sp	2	
	Cricotopus/Orthocladius gr	1	
	Cryptochironomus sp	1	
	Dicrotendipes sp	2	
	Eukiefferiella sp	2	
	Monopelopia sp	1	
	Paralauterborniella nigrohalteralis	5	

Polypedilum sp	75
Procladius sp	1
Rheocricotopus sp	1
Rheotanytarsus sp	3
Thienemanniella sp	2
Thienemannimyia gr	6
Unidentified Chironomid	2
Unidentified Chironomid	1
Unidentified Larvae	1
Xylotopus par	1
Simulium sp	23
Simulium sp	1
Culicoides sp	1
Unidentified Hydracarina (mite)	2
Gammarus sp	1581
Caecidotea sp	71

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/12/00</b>
	Amphipleura pellucida	14	
	Cocconeis pediculus	1	
	Cocconeis placentula var. euglypta	70	
	Cocconeis placentula var. lineata	108	
	Cyclotella pseudostelligera	4	
	Gomphonema intricatum var. pulvinatum	6	
	Gomphonema parvulum	2	
	Gyrosigma scalproides	2	
	Navicula auriculata	4	
	Navicula menisculus	2	
	Navicula minima	31	
	Navicula secreta var. apiculata	4	
	Navicula subminuscula	2	
	Navicula tenelloides	20	
	Navicula tripunctata	31	
	Navicula viridula var. rostellata	3	
	Nitzschia amphibia	2	
	Nitzschia denticula	3	
	Nitzschia dubia	1	
	Nitzschia frustulum	1	
	Nitzschia linearis	2	
	Nitzschia palea	2	
	Nitzschia perminuta	4	
	Nitzschia sp.	4	
	Nitzschia sp. 2	2	
	Planothidium lanceolata	6	
	Planothidium lanceolata var. dubia	2	
	Rhoicosphenia curvata	30	
	Rossithidium linearis f. curta	2	
	Stauroneis smithii	1	
	Surirella angustata	2	
	Surirella linearis	2	
	Synedra acus	1	
	Synedra delicatissima	1	
	Tryblionella tryblionella var. victoriae	2	

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/12/00</b>
	Lemanea cf. fluviatilis	1	
	Oscillatoria lutea	3	
	Schizothrix calcicola	5	

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**Fishes**

Site was too deep to sample

Invertebrates	Taxa	Individuals	09/15/00
	Dubiraphia sp (adult)	20	
	Pentacora sp	1	
	Elimia sp	128	
	Corbicula fluminea	3	
	Stenacron sp	6	
	Stenonema sp	5	
	Caenis sp	2	
	Acerpenna sp	2	
	Argia sp	11	
	Unidentified Corixid	1	
	Metrobates sp	1	
	Trepobates sp	1	
	Climacia sp	1	
	Hydroptila sp	1	
	Triaenodes sp	39	
	Micrasema sp	4	
	Cheumatopsyche sp	14	
	Hydropsyche sp	18	
	Psephenus herricki	77	
	Ancyronyx variegatus	2	
	Dubiraphia sp (larvae)	1	
	Macronychus glabratu	13	
	Stenelmis sp	11	
	Stenelmis sp	44	
	Tipula sp	1	
	Procladius sp	3	
	Thienemanniella sp	1	
	Simulium sp	1	
	Simulium sp	2	
	Gammarus sp	221	
	Caecidotea sp	62	

Diatoms	Taxa	Individuals	09/15/00
	Achnanthes sp. 2	5	
	Achnanthidium minutissima var. saprophila	6	
	Achnanthidium minutissimum	18	
	Caloneis hyalina	4	
	Cymbella hybrida	3	
	Cymbella minuta	1	
	Cymbella silesiaca	21	
	Frustulia rhomboides var. capitata	3	
	Frustulia vulgaris	4	
	Frustulia weinholdii	2	
	Gomphonema intricatum var. pulvinatum	2	
	Gomphonema parvulum	27	
	Hippodonta capitata	5	
	Melosira varians	12	
	Meridion circulare	3	
	Navicula cryptocephala	12	
	Navicula cryptotenella	4	
	Navicula elginensis	2	
	Navicula minima	29	

<i>Navicula radios</i> var. <i>tenella</i>	2
<i>Navicula schmassmannii</i>	2
<i>Navicula schroeteri</i> var. <i>escambia</i>	10
<i>Navicula</i> sp.	1
<i>Navicula subminuscula</i>	2
<i>Navicula tenera</i>	5
<i>Navicula tripunctata</i>	3
<i>Navicula viridula</i>	2
<i>Navicula viridula</i> var. <i>linearis</i>	1
<i>Nitzschia amphibia</i>	3
<i>Nitzschia dubia</i>	2
<i>Nitzschia flexa</i>	2
<i>Nitzschia palea</i>	2
<i>Nitzschia perminuta</i>	2
<i>Nitzschia</i> sp.	37
<i>Pinnularia legumen</i>	2
<i>Planothidium lanceolata</i> var. <i>dubia</i>	23
<i>Rhoicosphenia curvata</i>	6
<i>Rossithidium linearis</i> f. <i>curta</i>	7
<i>Sellaphora pupula</i>	4
<i>Surirella angustata</i>	9
<i>Surirella ovalis</i>	12
<i>Surirella ovata</i>	5
<i>Surirella ovata</i> var. <i>pinnata</i>	7
<i>Surirella tenera</i> var. <i>nervosa</i>	2
<i>Synedra rumpens</i> var. <i>familiaris</i>	4

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/15/00</b>
	<i>Cladophora</i> sp.	2	
	<i>Encyonema mesianum</i>	4	
	<i>Oscillatoria lutea</i>	1	
	<i>Porphyrosiphon animalis</i>	1	
	<i>Rhodochorton</i> sp.	1	

**Station ID:** CRR200013      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** LITTLE RIVER  
**County:** TRIGG      **Map Name:** CALEDONIA  
**Catchment Area:** 243.72      **River Mile:** 31.46      **Stream Order:** 5  
**Lat Dec:** 36.77781      **Long Dec:** -87.7223  
**Location:** SSR 1253-ABOVE CASEY CREEK CONFLUENCE W/ LITTLE RIVER

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### Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/26/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	23	
Bluntnose Minnow	<i>Pimephales notatus</i>	2	
Northern Hogsucker	<i>Hypentelium nigricans</i>	1	
Banded Sculpin	<i>Cottus carolinae</i>	18	
Rockbass	<i>Ambloplites rupestris</i>	1	
Bluegill	<i>Lepomis macrochirus</i>	1	
Longear Sunfish	<i>Lepomis megalotis</i>	1	
Saffron Darter	<i>Etheostoma flavum</i>	4	
Smallscale Darter	<i>Etheostoma microlepidum</i>	30	
Orangethroat Darter	<i>Etheostoma spectabile</i>	1	

### Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>07/12/00</b>
Dubiraphia sp (adult)	9	
Unidentified Cambaridae	6	
Unidentified Coenagrionid	1	
Stenonema sp	1	
Tricorythodes sp	1	
Procloeon sp	1	
Argia sp	1	
Enallagma sp	3	
Boyeria vinosa	2	
Hagenius sp	1	
Triaenodes sp	3	
Unidentified Leptocerid	1	
Hydropsyche sp	4	
Agabus sp	1	
Ancyronyx variegatus	2	
Dubiraphia sp (larvae)	2	
Macronychus glabratu	11	
Macronychus glabratu	5	
Stenelmis sp	2	
Stenelmis sp	2	
Cricotopus/Orthocladius gr	1	
Krenopelopia sp	1	
Paratendipes sp	1	
Polypedilum sp	1	
Procladius sp	1	
Crangonyx sp	9	
Gammarus sp	6	
Caecidotea sp	4	

### Diatoms

<b>Taxa</b>	<b>Individuals</b>	<b>07/12/00</b>
<i>Achnanthes biasolettiana</i>	3	
<i>Achnanthes exigua</i>	2	
<i>Achnanthes hauckiana</i>	50	
<i>Achnanthes</i> sp. 3	5	
<i>Achnanthidium minutissimum</i>	6	
<i>Amphipleura pellucida</i>	63	
<i>Cocconeis pediculus</i>	1	

Gomphonema brasiliense	42
Gyrosigma attenuatum	2
Gyrosigma spencerii	2
Karayevia clevei	2
Melosira varians	6
Navicula atomus	14
Navicula cf. goeppertiana	21
Navicula cryptotenella	8
Navicula ingenua	2
Navicula minima	138
Navicula seminulum	6
Navicula sp. 8	6
Navicula sp. 9a	4
Navicula subminuscula	4
Nitzschia amphibia	3
Nitzschia dissipata	5
Nitzschia sp. 4	4
Rhoicosphenia curvata	7
Rossithidium linearis	7

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>07/12/00</b>
None			

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## Fishes

Site was too deep to sample

<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/08/00</b>
Dubiraphia sp (adult)	14		
Stelechomyia purpulchra	1		
Stenacron sp	3		
Stenonema sp	15		
Tricorythodes sp	47		
Caenis sp	3		
Procloeon sp	15		
Argia sp	12		
Enallagma sp	14		
Calopteryx sp	2		
Basiaeschna janata	1		
Dromogomphus sp	1		
Macromia sp	1		
Neoplea striola	1		
Rheumatobates sp	1		
Trepobates sp	2		
Hydroptila sp	2		
Oecetis sp	3		
Triaenodes sp	23		
Cheumatopsyche sp	1		
Hydropsyche sp	3		
Lype diversa	5		
Cyphon sp	1		
Berosus sp A	1		
Berosus sp(larvae)	3		
Ancyronyx variegatus	20		
Ancyronyx variegatus	10		

Dubiraphia sp (larvae)	6
Macronychus glabratus	31
Macronychus glabratus	43
Stenelmis sp	12
Stenelmis sp	15
Anopheles sp	1
Hemerodromia sp	1
Ablabesmyia sp	10
Dicrotendipes sp	1
Paratanytarsus sp	2
Polypedilum sp	1
Pseudochironomus sp	1
Pseudosmittia sp	1
Rheocricotopus sp	1
Stempellinella sp	5
Stenochironomus sp	2
Tanytarsus sp	4
<i>Tribelos</i> sp	1
Unidentified Chironomid	10
Chrysops sp	2
Unidentified Hydracarina (mite)	2
Gammarus sp	9

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/08/00</b>
	Achnanthes hauckiana	16	
	Achnanthes sp. 2	124	
	Achnanthidium minutissimum	2	
	Amphora perpusilla	25	
	Cocconeis placentula var. euglypta	4	
	Diploneis oblongella	8	
	Gomphonema brasiliense	8	
	Gomphonema parvulum	2	
	Gyrosigma spencerii var. curvula	2	
	Hippodonta capitata	2	
	Luticola mutica	2	
	Melosira varians	5	
	Navicula auriculata	12	
	Navicula hustedtii	7	
	Navicula ingenua	9	
	Navicula laterorostrata	2	
	Navicula menisculus	2	
	Navicula minima	80	
	Navicula saxophila	5	
	Navicula schmassmannii	6	
	Navicula schroeteri var. escambia	10	
	Navicula secreta var. apiculata	4	
	Navicula sp. 8	6	
	Navicula sp. 9a	4	
	Navicula subatomoides (like)	8	
	Navicula subminuscula	2	
	Navicula tantula	24	
	Nitzschia amphibia	6	
	Nitzschia dissipata	7	
	Nitzschia frustulum	10	
	Nitzschia parvula	2	
	Nitzschia sp. 5	4	
	Nitzschia sp. 6	2	
	Planothidium lanceolata	3	
	Rhoicosphenia curvata	6	
	Rossithidium linearis f. curta	4	

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/08/00</b>
	<i>Sellaphora pupula</i>	4	
	<i>Tryblionella levidensis</i>	2	
	<i>Tryblionella tryblionella</i> var. <i>victoriae</i>	2	
	Anabaena sp.	1	
	<i>Characium pringsheimii</i>	40	
	<i>Cladophora</i> sp.	1000	
	<i>Oscillatoria lutea</i>	3	
	<i>Schizothrix calcicola</i>	5	
	Unidentified coccoid	4	

**Station ID:** CRR200014      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** CASEY CREEK  
**County:** TRIGG      **Map Name:** CALEDONIA  
**Catchment Area:** 30.72      **River Mile:** 33.66      **Stream Order:** 4  
**Lat Dec:** 36.75579      **Long Dec:** -87.72483  
**Location:** ROARING SPRINGS RD-PUBLIC FISHING AREA HWY 525

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## Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/18/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	4	
Striped Shiner	<i>Luxilus chryscephalus</i>	1	
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	1	
Creek Chub	<i>Semotilus atromaculatus</i>	4	
Banded Sculpin	<i>Cottus carolinae</i>	140	
Bluegill	<i>Lepomis macrochirus</i>	2	
Saffron Darter	<i>Etheostoma flavum</i>	15	
Orangethroat Darter	<i>Etheostoma spectabile</i>	10	

## Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>06/26/00</b>
Dubiraphia sp (adult)	1	
Elimia sp	9	
Eclipidrilus sp	1	
Unidentified Leptophlebiid	1	
Stenonema sp	2	
Eurylophella sp	2	
Acentrella sp	19	
Boyeria vinosa	5	
Trichocorixa sp	1	
Microvelia sp	3	
Pycnopsyche sp	1	
Glossosoma sp	82	
Cheumatopsyche sp	50	
Hydropsyche sp	117	
Polycentropus sp	1	
Gyrinus sp	3	
Agabus sp	1	
Ancyronyx variegatus	1	
Dubiraphia sp (larvae)	1	
Macronychus glabratus	1	
Optioservus sp	46	
Optioservus sp	26	
Hexatoma sp	1	
Limonia sp	7	
Polypedilum sp	3	
Simulium sp	54	
Unidentified Simuliid	6	
Gammarus sp	2000	
Lirceus fontinalis	38	

## Diatoms

<b>Taxa</b>	<b>Individuals</b>	<b>06/26/00</b>
Achnanthes exigua	4	
Achnanthes pusilla	58	
Achnanthidium minutissimum	24	
Amphora perpusilla	2	
Cymbella affinis	2	
Cymbella cistula	1	
Cymbella silesiaca	2	
Cymbella sp.	2	
Fragilaria construens	2	

Gomphonema acuminatum	2
Gomphonema parvulum	13
Gonium sp. 1	23
Melosira varians	37
Meridion circulare	2
Navicula cryptocephala	2
Navicula cryptotenella	8
Navicula menisculus	14
Navicula minima	32
Navicula saxophila	2
Navicula tripunctata	2
Navicula trivialis	2
Nitzschia dissipata	7
Nitzschia fonticola	30
Nitzschia frustulum	73
Nitzschia sp.	14
Nitzschia vermicularis	2
Planothidium lanceolata	24
Planothidium lanceolata var. dubia	4
Reimeria sinuata	2
Rhizoclonium hieroglyphicum	1000
Rossithidium linearis f. curta	6
Surirella angustata	5
Surirella ovata	6
Surirella ovata var. pinnata	2
Synedra rumpens var. familiaris	9
Synedra ulna	7

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>06/26/00</b>
Closterium sp. 1		1	
Mougeotia sp.		90	
Oscillatoria lutea		8	
Porphyrosiphon splendidus		1000	
Schizothrix calcicola		1000	
Schizothrix sp.		8	
Unidentified filament		6	

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<b>Fishes</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>10/12/00</b>
Largescale Stoneroller		<i>Campostoma oligolepis</i>	1	
Banded Sculpin		<i>Cottus caroliniae</i>	21	
Saffron Darter		<i>Etheostoma flavum</i>	1	
Orangethroat Darter		<i>Etheostoma spectabile</i>	2	

<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/05/00</b>
Dubiraphia sp (adult)		4	
Elimia sp		12	
Unidentified Lumbriculid		4	
Unidentified Naidid		1	
Unidentified Hirudinea		1	
Unidentified Leptophlebiid		1	
Isonychia sp		4	
Stenonema sp		9	
Eurylophella sp		1	
Caenis sp		1	
Acentrella sp		6	
Baetis sp		82	
Calopteryx maculata		12	

Alloperla sp	2
Sigara sp	2
Microvelia sp	11
Ranatra buenoi	4
Belostoma sp	1
Rheumatobates sp	2
Trepobates sp	2
Mystacides sp	1
Glossosoma sp	2
Cheumatopsyche sp	8
Hydropsyche sp	3
Lype diversa	4
Nyctiophylax sp	2
Polycentropus sp	7
Cyphon sp	1
Gyrinus sp	1
Gyrinus sp	12
Anopheles sp	1
Hexatoma sp	2
Dixella sp	2
Dicrotendipes sp	10
Microspectra sp	22
Microtendipes sp	15
Orthocladius sp	5
Parametriocnemus sp	2
Paratendipes sp	6
Phaenopsectra sp	14
Phaenopsectra/Tribelos sp	2
Polypedilum sp	5
Rheotanytarsus sp	5
Synorthocladius semivirens	4
Tanytarsus sp	6
Thienemannimyia gr	6
Unidentified Chironomid	9
Pericoma sp	4
Atrichopogon sp	2
Unidentified Hydracarina (mite)	3
Gammarus sp	908
Lirceus fontinalis	24

Diatoms	Taxa	Individuals	09/05/00
	Achnanthes biasolettiana	7	
	Achnanthes pusilla	39	
	Achnanthes sp.1	8	
	Achnanthidium minutissimum	49	
	Amphipleura pellucida	2	
	Amphora perpusilla	11	
	Cocconeis placentula var. euglypta	2	
	Cocconeis placentula var. lineata	8	
	Frustulia vulgaris	2	
	Gomphonema intricatum var. pulvinatum	2	
	Gomphonema parvulum	6	
	Gyrosigma scalpoides	2	
	Melosira varians	7	
	Meridion circulare	2	
	Navicula cryptocephala	4	
	Navicula cryptotenella	3	
	Navicula hustedtii	8	
	Navicula menisculus	2	
	Navicula minima	37	

<i>Navicula rhynchocephala</i> var. <i>germanii</i>	2
<i>Navicula schadei</i>	2
<i>Navicula seminulum</i>	6
<i>Navicula subatomoides</i> (like)	4
<i>Navicula tripunctata</i>	2
<i>Navicula veneta</i>	2
<i>Nitzschia acicularis</i>	4
<i>Nitzschia amphibia</i>	7
<i>Nitzschia dissipata</i>	8
<i>Nitzschia fonticola</i>	4
<i>Nitzschia frustulum</i>	68
<i>Nitzschia linearis</i>	6
<i>Nitzschia palea</i>	2
<i>Nitzschia perminuta</i>	2
<i>Nitzschia</i> sp.	12
<i>Nitzschia</i> sp. 4	23
<i>Nitzschia vermicularis</i>	4
<i>Planothidium lanceolata</i>	26
<i>Planothidium lanceolata</i> var. <i>dubia</i>	11
<i>Rossithidium linearis</i> f. <i>curta</i>	17
<i>Surirella angustata</i>	2
<i>Surirella ovata</i> var. <i>pinnata</i>	9
<i>Synedra ulna</i>	10

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/05/00</b>
	<i>Closterium</i> sp. 1	1	
	<i>Oscillatoria lutea</i>	1100	
	<i>Schizothrix calcicola</i>	450	
	<i>Stichosiphon sansibaricus</i>	20	

**Station ID:** CRR200015      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** CASEY CREEK  
**County:** TRIGG      **Map Name:** ROARING SPRING  
**Catchment Area:** 8.25      **River Mile:** 0      **Stream Order:** 4  
**Lat Dec:** 36.74586      **Long Dec:** -87.74755  
**Location:** UP BERKLEY ROAD(ALLEN FARM) TO HOUSE, TAKE LEFT TO STREAM  
**Collection Date:** 6/29/00

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## Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/26/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	34	
Rosefin Shiner	<i>Lythrurus fasciolaris</i>	2	
Creek Chub	<i>Semotilus atromaculatus</i>	13	
White Sucker	<i>Catostomus commersoni</i>	3	
Creek Chubsucker	<i>Erimyzon oblongus</i>	7	
Banded Sculpin	<i>Cottus carolinae</i>	21	
Green Sunfish	<i>Lepomis cyanellus</i>	2	
Bluegill	<i>Lepomis macrochirus</i>	1	
Fringed Darter	<i>Etheostoma crossopterum</i>	1	
Orangethroat Darter	<i>Etheostoma spectabile</i>	14	

<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>06/29/00</b>
	Dubiraphia sp (adult)	5	
	Heterosternuta sp	7	
	Unidentified Cambaridae	2	
	Ferrissia sp	2	
	Physella sp	35	
	Elimia sp	6	
	Menetus dilatatus	6	
	Unidentified Leptophlebiid	1	
	Stenonema sp	10	
	Boyeria vinosa	4	
	Perithemis sp	1	
	Sigara sp	75	
	Microvelia sp	4	
	Notonecta sp	1	
	Gerris sp	4	
	Trepobates sp	2	
	Sialis sp	1	
	Hydroptila sp	1	
	Mystacides sp	1	
	Psephenus herricki	1	
	Peltodytes sp	10	
	Helophorus sp	1	
	Enochrus sp	2	
	Paracymus sp	2	
	Tropisternus sp	5	
	Agabus sp	1	
	Dytiscus sp	1	
	Dytiscus sp	1	
	Neoporus sp	4	
	Neoporus sp	5	
	Ancyronyx variegatus	2	
	Anopheles sp	17	
	Hexatoma sp	1	
	Ablabesmyia sp	3	
	Chironomus sp	2	

Corynoneura sp	1
Cricotopus sp	1
Cricotopus/Orthocladius gr	4
Dicrotendipes sp	65
Helopelopia sp	1
Krenopelopia sp	1
Larsia sp	1
Microspectra sp	103
Microtendipes sp	7
Parametriocnemus sp	1
Paratanytarsus sp	10
Polypedilum sp	7
Rheotanytarsus sp	7
Thienemannimyia gr	1
Unidentified Chironomid	40
Zavrelimyia sp	3
Culicoides sp	1
Gammarus sp	26
Hyalella azteca	1
Lirceus fontinalis	132

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>06/29/00</b>
Achnanthes pusilla		12	
Achnanthidium minutissimum		10	
Cymbella cistula		54	
Cymbella minuta		2	
Cymbella silesiaca		24	
Cymbella sp.		1	
Cymbella tumida		2	
Frustulia vulgaris		2	
Gomphonema parvulum		2	
Melosira varians		95	
Meridion circulare		14	
Navicula cryptocephala var. veneta		4	
Navicula hustedtii		2	
Navicula minima		18	
Navicula phyllepta		6	
Navicula tripunctata		2	
Nitzschia dissipata		5	
Nitzschia fonticola		6	
Nitzschia frustulum		22	
Nitzschia linearis		33	
Planothidium lanceolata		37	
Rossithidium linearis f. curta		32	
Surirella angustata		6	
Synedra rumpens var. familiaris		26	
Synedra ulna		18	

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>06/29/00</b>
Anabaena sp.		1	
Oscillatoria lutea		41	
Porphyrosiphon splendidus		1	
Schizothrix calcicola		39	
Unidentified filament		22	

**Fishes**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>09/08/00</b>
Creek Chub	<i>Semotilus atromaculatus</i>	9	
Creek Chubsucker	<i>Erimyzon oblongus</i>	1	
Banded Sculpin	<i>Cottus carolinus</i>	55	
Orangethroat Darter	<i>Etheostoma spectabile</i>	2	

**Invertebrates**

<b>Taxa</b>	<b>Individuals</b>	<b>09/08/00</b>
Elimia sp	1	
Sigara sp	1	
Mesovelia sp	1	
Sialis sp	4	
Micrasema sp	29	
Micrasema sp	20	
Glossosoma sp	2	
Limonia sp	1	
Atherix sp	1	
Cricotopus sp	2	
Cricotopus/Orthocladius gr	1	
Eukiefferiella sp	1	
Helopelopia sp	5	
Microspectra sp	7	
Microtendipes sp	1	
Parametriocnemus sp	1	
Paratendipes sp	3	
Phaenopsectra sp	5	
Polypedilum sp	13	
Pseudosmittia sp	1	
Rheotanytarsus sp	7	
Tanytarsus sp	2	
Thienemannimyia gr	1	
Chrysops sp	2	
Probezzia sp	1	
Unidentified Hydracarina (mite)	29	
Gammarus sp	2000	
Caecidotea sp	1	
Lirceus fontinalis	27	

**Diatoms**

<b>Taxa</b>	<b>Individuals</b>	<b>09/08/00</b>
<i>Achnanthes biasolettiana</i>	1	
<i>Achnanthes pusilla</i>	19	
<i>Achnanthidium minutissimum</i>	84	
<i>Amphora ovalis</i> var. <i>affinis</i>	3	
<i>Amphora perpusilla</i>	18	
<i>Cocconeis placentula</i> var. <i>lineata</i>	19	
<i>Cymbella silesiaca</i>	2	
<i>Cymbella</i> sp.	3	
<i>Cymbella turgidula</i>	5	
<i>Frustulia vulgaris</i>	1	
<i>Gomphonema parvulum</i>	11	
<i>Gonium pectorale</i>	1	
<i>Gyrosigma scalpoides</i>	2	
<i>Gyrosigma spencerii</i>	3	
<i>Melosira varians</i>	7	
<i>Meridion circulare</i>	3	
<i>Merismopedia punctata</i>	2	

Mougeotia sp.	6
Navicula contenta var. biceps	2
Navicula cryptocephala	6
Navicula hustedtii	2
Navicula menisculus	2
Navicula tenelloides	8
Navicula tripunctata	2
Navicula trivialis	6
Nitzschia amphibia	7
Nitzschia apiculata	2
Nitzschia debilis	2
Nitzschia dissipata	4
Nitzschia frustulum	8
Nitzschia linearis	5
Nitzschia palea	2
Nitzschia perminuta	1
Nitzschia sp.	2
Nitzschia sp. 4	2
Planothidium lanceolata	34
Planothidium lanceolata var. dubia	28
Rossithidium linearis f. curta	60
Stauroneis smithii	2
Surirella ovata	2
Surirella ovata var. pinnata	2
Synedra rumpens	7
Synedra ulna	1

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/08/00</b>
	Calothrix parietina	2	
	Oedogonium sp.	8	
	Schizothrix calcicola	113	
	Stigeoclonium sp.	1	
	Unidentified filament	41	

**Station ID:** CRR200016      **Ecoregion:** INTERIOR PLATEAU  
**Basin:** LOWER      **Stream Name:** SINKING FORK  
**County:** TRIGG      **Map Name:** CALEDONIA  
**Catchment Area:** 106.93      **River Mile:** 4.12      **Stream Order:** 4  
**Lat Dec:** 36.84078      **Long Dec:** -87.74045  
**Location:** KINGS CHURCH ROAD@ BRIDGE  
**Collection Date:** 6/26/00

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### Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>07/26/00</b>
Banded Sculpin	<i>Cottus carolinae</i>	34	

### Invertebrates

<b>Taxa</b>	<b>Individuals</b>	<b>06/26/00</b>
Dubiraphia sp (adult)	1	
Unidentified Cambaridae	2	
Unidentified Hydrobiid	11	
Physella sp	4	
Elimia sp	51	
Stenacron sp	1	
Stenonema sp	4	
Fallceon sp	31	
Enallagma sp	1	
Boyeria vinosa	4	
Pycnopsyche sp	1	
Glossosoma sp	9	
Cheumatopsyche sp	28	
Hydropsyche sp	40	
Psephenus herricki	19	
Macronychus glabratus	8	
Macronychus glabratus	18	
Optioservus sp	91	
Optioservus sp	3	
Stenelmis sp	7	
Stenelmis sp	3	
Limonia sp	1	
Tipula sp	1	
Polypedilum sp	3	
Simulium sp	45	
Unidentified Simuliid	2	
Probezzia sp	2	
Unidentified Hydracarina (mite)	2	
Gammarus sp	1146	
Caecidotea sp	53	

### Diatoms

<b>Taxa</b>	<b>Individuals</b>	<b>06/26/00</b>
Achnanthes biasolettiana	47	
Achnanthes pusilla	16	
Achnanthes sp.	85	
Achnanthidium minutissimum	11	
Amphora perpusilla	60	
Cocconeis pediculus	3	
Cocconeis placentula var. euglypta	7	
Gomphonema intricatum var. pulvinatum	1	
Gomphonema parvulum	5	
Gyrosigma scalpoides	4	
Melosira distans var. alpigena	15	
Melosira varians	18	
Navicula atomus	3	

Navicula minima	22
Navicula seminulum	2
Navicula sp. 3	2
Navicula subminuscula	14
Navicula tripunctata	15
Nitzschia amphibia	17
Nitzschia dissipata	2
Nitzschia frustulum	4
Nitzschia palea	1
Nitzschia sigmoidea	1
Nitzschia sp.	1
Nitzschia sp. 4	2
Planothidium lanceolata var. dubia	2
Rhoicosphenia curvata	22
Rossithidium linearis f. curta	8

<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>06/26/00</b>
	Cladophora sp.	1	
	Lemanea cf. fluviatilis	17	
	Mougeotia sp.	1	
	Oscillatoria lutea	17	
	Rhodochorton sp.	22	
	Stichosiphon sansibaricus	11	

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### Fishes

<b>Common Name</b>	<b>Scientific Name</b>	<b>Individuals</b>	<b>10/12/00</b>
Largescale Stoneroller	<i>Campostoma oligolepis</i>	1	
Striped Shiner	<i>Luxilus chryscephalus</i>	1	
Creek Chub	<i>Semotilus atromaculatus</i>	2	
Banded Sculpin	<i>Cottus carolinae</i>	17	
Longear Sunfish	<i>Lepomis megalotis</i>	1	
Orangethroat Darter	<i>Etheostoma spectabile</i>	4	

<b>Invertebrates</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/08/00</b>
	Dubiraphia sp (adult)	1	
	Unidentified Hydrobiid	6	
	Elimia sp	19	
	Pleurocera sp	1	
	Stenacron sp	4	
	Stenonema sp	14	
	Baetis sp	7	
	Procloeon sp	3	
	Argia sp	3	
	Calopteryx sp	12	
	Basiaeschna janata	1	
	Boyeria sp	3	
	Hagenius sp	3	
	Macromia sp	1	
	Cheumatopsyche sp	37	
	Hydropsyche sp	31	
	Helichus sp	9	
	Psephenus herricki	5	
	Unidentified Curculionid	1	
	Macronychus glabratus	36	
	Macronychus glabratus	33	
	Optioservus sp	6	
	Stenelmis sp	1	
	Stenelmis sp	2	

Cryptotendipes sp	1
Polypedilum sp	3
Rheotanytarsus sp	1
Simulium sp	4
Gammarus sp	1400
Caecidotea sp	24

<b>Diatoms</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/08/00</b>
Achnanthes microcephala	6		
Achnanthes pusilla	2		
Achnanthidium minutissimum	34		
Amphora perpusilla	85		
Coccconeis placentula var. euglypta	22		
Coccconeis placentula var. lineata	4		
Gyrosigma scalpoides	2		
Luticola mutica	2		
Melosira varians	4		
Navicula cf. goeppertiana	2		
Navicula contenta	33		
Navicula cryptotenella	4		
Navicula hustedtii	6		
Navicula menisculus	4		
Navicula minima	116		
Navicula radiosa var. tenella	4		
Navicula sp. 10	2		
Navicula sp. 11	2		
Navicula tenelloides	12		
Navicula tripunctata	4		
Nitzschia amphibia	6		
Nitzschia dissipata	2		
Nitzschia frustulum	2		
Nitzschia sinuata var. tabellaria	2		
Nitzschia sp.	13		
Planothidium lanceolata	2		
Planothidium lanceolata var. dubia	2		
Reimeria sinuata	4		
Rhoicosphenia curvata	16		
Rossithidium linearis f. curta	2		
<b>Non-Diatom Algae</b>	<b>Taxa</b>	<b>Individuals</b>	<b>09/08/00</b>
Oscillatoria lutea		11	

## APPENDIX C.

### Financial & Administrative Close-out

#### 1. SUMMARIZATION OF ALL BUDGET EXPENDITURES, including matching funds. Recommend how excess project funds should be reallocated.

The original budget for the project was \$120,000 of which \$72,000 was to come from Section 319(h) funds and \$48,000 from non-federal match. The actual non-federal match totaled \$48,000 with a \$211 over match and was comprised of release time for our senior technical staff and some data entry support. Grant expenses from Section 319(h) funds totaled \$72,000 and included \$2,935 in supply costs plus personnel and \$799 in travel costs. All travel costs were expended in sample collection. Total expenditures including Section 319(h) and non-federal match were \$120,000 with a \$211 over match..

#### Original Budget

Budget Categories	319 Grant	Murray State University Match	Total
Personnel	\$ 48,530	\$ 34,259	\$ 82,789
Supplies	\$ 3,452	\$ -	\$ 3,452
Equipment	\$ -	\$ -	\$ -
Travel	\$ 800	\$ -	\$ 800
Contractual	\$ -	\$ -	\$ -
Operating Costs	\$ 19,218	\$ 13,741	\$ 32,959
Other	\$ -	\$ -	\$ -
<b>TOTAL:</b>	<b>\$ 72,000</b>	<b>\$ 48,000</b>	<b>\$120,000</b>
	60%	40%	100%

#### Final Budget

Budget Categories	319 Grant	Murray State University Match	Total
Personnel	\$ 47,878	\$ 34,613	\$ 82,491
Supplies	\$ 2,935	\$ -	\$ 2,935
Equipment	\$ -	\$ -	\$ -
Travel	\$ 799	\$ -	\$ 799
Contractual	\$ -	\$ -	\$ -
Operating Costs	\$ 20,388	\$ 13,597	\$ 33,985
Other - Excess Expenditures	\$ -	\$ (211)	\$ (211)
<b>TOTAL:</b>	<b>\$ 72,000</b>	<b>\$ 48,000</b>	<b>\$120,000</b>
	60%	40%	100%

There were no excess project funds be reallocated.

#### 2. Equipment No equipment was purchased with project funds and there was not equipment purchased with a fair market value exceeding \$5,000.