



water resources / environmental consultants

3 Innwood Circle, Suite 220 • Little Rock, AR 72211-2449 • (501) 225-7779 • Fax (501) 225-6738

TECHNICAL MEMORANDUM

DATE: June 7, 2010

TO: **Mr. Lucius Boudreaux**
Dow Chemical Company, North America

FROM: **Mr. Jim Malcolm** *JM*
FTN Associates, Ltd.

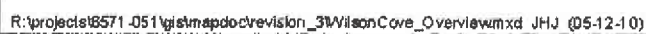
SUBJECT: Lake Catherine Fish Sampling Results
FTN No. 6571-051

1.0 INTRODUCTION

This technical memorandum summarizes the results of fish sampling in Wilson Creek Cove, Lake Catherine, Arkansas (Figure 1.1). Wilson Creek Cove is a small embayment of Lake Catherine that receives input from Wilson Creek. Wilson Creek is made up primarily of treated stormwater runoff from the UMETCO reclaimed mine site. The purpose of the study was to evaluate possible effects of the UMETCO discharge (via Wilson Creek) on the fish community in Wilson Creek Cove. The approach included qualitative sampling of the fish population to evaluate the kinds of species present and their relative abundance according to expectations based on available habitat.

The UMETCO discharge from Outfall 001 to Wilson Creek is an essentially continuous discharge that typically makes up the majority of the flow in Wilson Creek. Water levels in Lake Catherine are managed such that water level fluctuations are minimal in order to protect shoreline property. Therefore, the conditions present during the sampling conducted on May 6, 2010, are likely typical.

Page 2



2.0 STUDY METHODS

The study was conducted on May 6, 2010, with personnel from FTN Associates, Ltd. (FTN); Rimfire Technical Services, Inc. (Rimfire); and Arkansas Tech University. Fish were collected using a boat-mounted electroshocker and an experimental gill net (0.5-inch, 1.5-inch and 3-inch mesh sizes). The electroshocker was operated in shallow shoreline and open-water areas containing visible cover (brush, emergent vegetation, overhanging trees, etc.). The gill net was deployed upon arrival to the sampling site perpendicular to the shoreline in approximately 1.5 to 2 meters of water. The net was retrieved and the fish were removed approximately 2 hours after deployment. All fish were placed in an aerated live well upon capture. At the end of the sampling, all fish captured were identified to species, measured (total length in millimeters), enumerated, and returned to the lake. The sampling techniques used are biased towards larger fish and will tend to undersample small fish in very shallow heavily vegetated areas.

3.0 RESULTS AND DISCUSSION

Suitable fish habitat was available in the form of a shallow vegetated area in the upper end of the cove, shallow shoreline areas with overhanging vegetation, and some structures (rocks, woody debris). Small areas of open-water structures (brush, woody debris) were present but were a minor component of the available habitat. A substantial portion of the cove is a shallow flat 2- to 5-ft deep with a silty bottom. Although much of the upper portion of the cove was less than 3 ft in depth, the shocking boat was able to access all but the shallowest areas.

Results of fish sampling are summarized in Table 3.1. The majority of fish were captured by electroshocking. The "pedal down" electroshocking duration was 951 seconds. A total of 14 species and 234 individuals were collected by both methods combined. Bluegill and longear sunfish comprised 73% of the total numbers collected and 14% of the total species. Golden red horse, gizzard shad, spotted sucker, largemouth bass, bluntnose minnows and channel catfish made up most of the remaining 27% with blackspotted topminnows, brook silversides, spotted gar, green sunfish, warmouth sunfish, and spotted bass making up less than 3% of the catch (one individual each). The catch per unit effort (CPUE), assuming all fish were captured by electroshocking, was 14.8 fish per minute. Electroshocker operators noted abundant fish in all suitable habitats. The CPUE of nearly 15 fish per minute represents a high catch rate for daytime sampling.

Length-frequency histograms (Figure 3.1) were prepared for bluegill and longear sunfish, which were present in relatively large numbers in the sample. Examination of the histograms indicates that there are at least two, and likely three or more, age groups present for each species. This result indicates that the cove supports various age groups of these species.



Table 3.1 Summary of fish sampling (electroshocking and gill net combined) from Wilson Creek Cove, Lake Catherine, on May 6, 2010.

Species Name	Common Name	Number of Individuals	Relative Abundance (%)	Mean length (mm)
<i>Lepomis megalotis</i>	Longear sunfish	93	39.7	83
<i>L. macrochirus</i>	Bluegill	78	33.3	68
<i>Moxostoma erythrurum</i>	Golden redhorse	23	9.8	203
<i>Dorosoma cepedianum</i>	Gizzard shad	10	4.3	263
<i>Minytrema melanops</i>	Spotted sucker	7	3.0	253
<i>Micropterus salmoides</i>	Largemouth bass	6	2.6	289
<i>Pimephales notatus</i>	Bluntnose minnow	6	2.6	57
<i>Ictalurus punctatus</i>	Channel catfish	5	2.1	485
<i>Fundulus olivaceus</i>	Blackspotted topminnow	1	0.4	65
<i>Labidesthes sicculus</i>	Brook silverside	1	0.4	63
<i>Lepisosteus oculatus</i>	Spotted gar	1	0.4	568
<i>L. cyanellus</i>	Green sunfish	1	0.4	56
<i>L. gulosus</i>	Warmouth sunfish	1	0.4	185
<i>Micropterus punctatus</i>	Spotted bass	1	0.4	81
Total Number of Species		14		
Total Number of Individuals.		234		
CPUE (Number of Fish per Minute)		14.8		

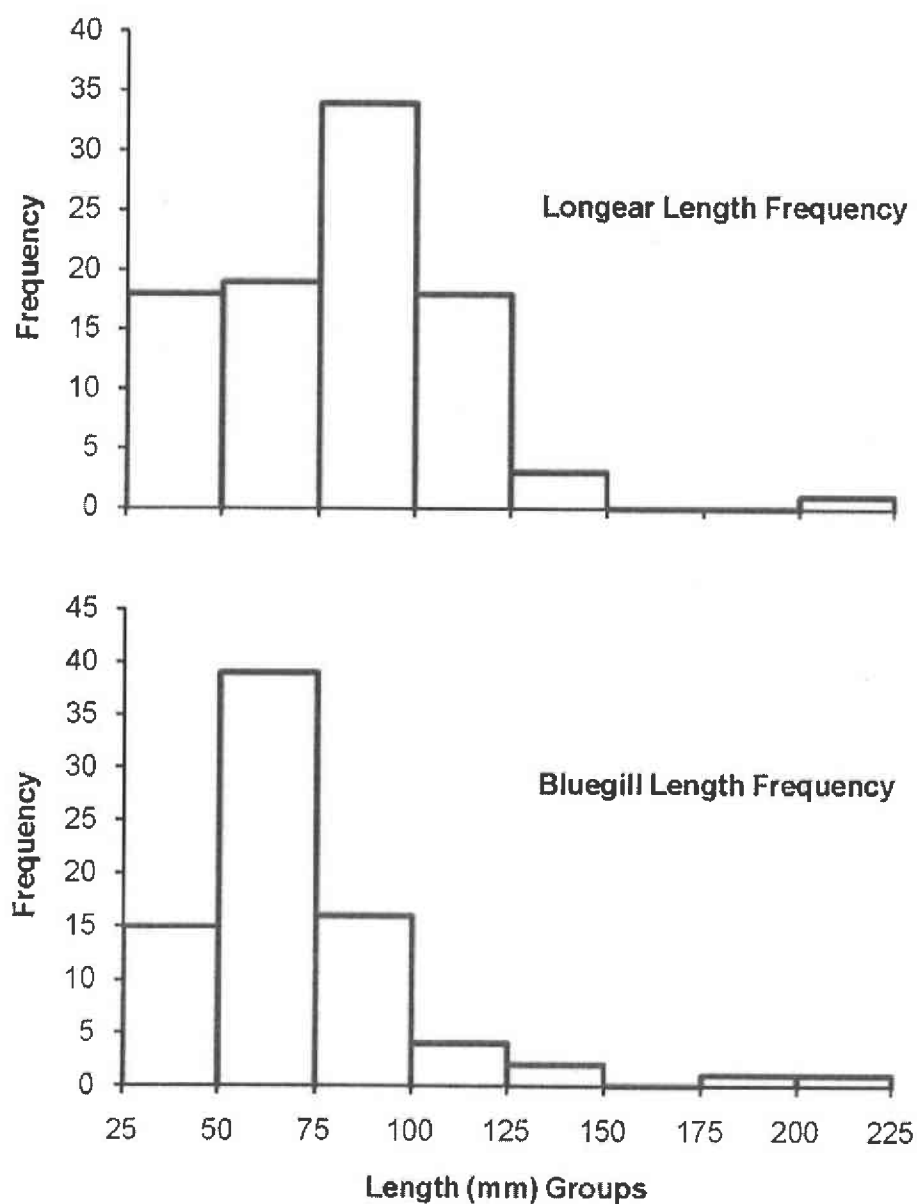


Figure 3.1. Length-frequency histograms of longear sunfish (top figure) and bluegill (bottom figure) collected from Wilson Creek Cove on May 6, 2010.

Mr. Lucius Boudreaux
June 7, 2010
Page 6

4.0 CONCLUSIONS

The numbers and types of species captured and observed in Wilson Creek Cove are consistent with expectations based on the available habitat, and indicate water quality that supports a productive and diverse fish community.

5.0 LITERATURE CITED

APCEC. 2007. Regulation No. 2: Regulation establishing water quality standards for surface waters of the state of Arkansas. Arkansas Pollution Control and Ecology Commission. Effective November 15, 2007. Little Rock, AR.

JTM/hlf

RAWP_FILES\6571-05\1\CORRESPONDENCE\TM-L BOUDREAUX 06-07-10 APCEC SUBMITTAL\TM-L BOUDREAUX 06-07-10.DOCX

