

**Summary of Stream Habitat and Fish Inventories on the  
Big Piney, Pleasant Hill, and St. Francis Ranger Districts,  
Ozark-St. Francis National Forest, 2008**



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December 2008**



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## Introduction

The USDA Forest Service, Southern Research Station, Center for Aquatic Technology Transfer (CATT) has worked with resource managers on the Ozark National Forest (ONF) since 2004 to develop and implement customized stream inventories. CATT field crews have performed inventories on the Sylamore Ranger District (Leonard et. al. 2004; Krause and Roghair, 2007), the Magazine and Boston Mountain Ranger Districts (Nuckols and Roghair, 2006; Krause and Roghair, 2007), and the Bayou, Buffalo, and Pleasant Hill Ranger Districts (Krause and Roghair, 2006; 2007). In spring 2008 the ONF requested additional assistance with stream habitat and fish inventories on the Big Piney, Pleasant Hill, and St. Francis Ranger Districts. We deployed a biologist and 5 technicians from May 25 to June 17, 2008 to quantify stream habitat conditions and provide associated fish assemblage information.

## Methods

### Habitat Inventory

Two-person crews performed customized stream habitat inventories (Krause and Roghair, 2006; 2007) based on the basinwide visual estimation technique (BVET) (Dolloff et al. 1993). We measured or estimated the following attributes:

All Habitat Units	Sub-Sample of Habitat Units
Type of habitat	Bankfull channel width
Length and width	Channel gradient
Maximum and average depth	Water temperature
Riffle crest depth	Photographs
Dominant and subdominant substrate	GPS coordinates
Rosgen channel type (Rosgen, 1996)	
Percent fines	
Large wood counts	

In addition, we noted stream features encountered including:

Stream Features
Waterfall
Tributary
Side Channel
Braided channel
Seep (spring)
Landslide
Bridge
Ford
Dam
Culvert

## **Fish Inventory**

A four-person crew using a DC backpack electrofisher collected fish assemblage information from a sub-sample of habitat inventory pools and riffles as described in Krause and Roghair (2006, 2007).

We recorded the following data:

- GPS coordinates
- Type of habitat unit
- Species name
- Counts of adult, age-0, and voucher specimens
- Electrofishing time (sec) and voltage

## **Pebble Count**

Electrofishing crews also conducted pebble counts (Wolman heel-to-toe steps protocol; Wolman, 1954) in sub-sampled riffle habitat units to characterize the substrate composition of sample reaches. Crew members measured the intermediate axis of a minimum of 100 pebbles per riffle as described in Bunte and Abt (2001).

## **Results**

The CATT and ONF personnel performed 31 inventories on 78 km of streams within 63 National Hydrography Dataset (NHD) stream reaches (Table 1 and 2). Field crews recorded a total of 10.5 km of dry habitat, of which 9.4 km of dry habitat was on the St. Francis Ranger District. Due to dry habitat, BVET analyses on 16 of the 31 inventories are incomplete; however the data will be useful in describing overall channel conditions. We collected fish data from 30 pools and 37 riffles within 19 NHD reaches and pebble data from 38 riffles within 18 reaches (Table 3). We captured a total of 15 different fish species in 2008 (Table 4). The data collected by the CATT can be used to describe stream condition on the ONF and serve as a baseline for future comparisons.

## **Data Availability**

Summer 2004-2008 habitat, fish, and pebble data are ready for migration into the Natural Resource Information System water module (NRIS). We will format the data according to the Regional NRIS Water standards and migrate the data as the new NRIS water module comes online. As data are migrated into NRIS Water the CATT will coordinate development of custom query and reporting tools for the ONF. In the interim, the CATT is available to assist with data analysis and report preparation. Keith Whalen, ONF Fishery Biologist, received a copy of all data in electronic format.

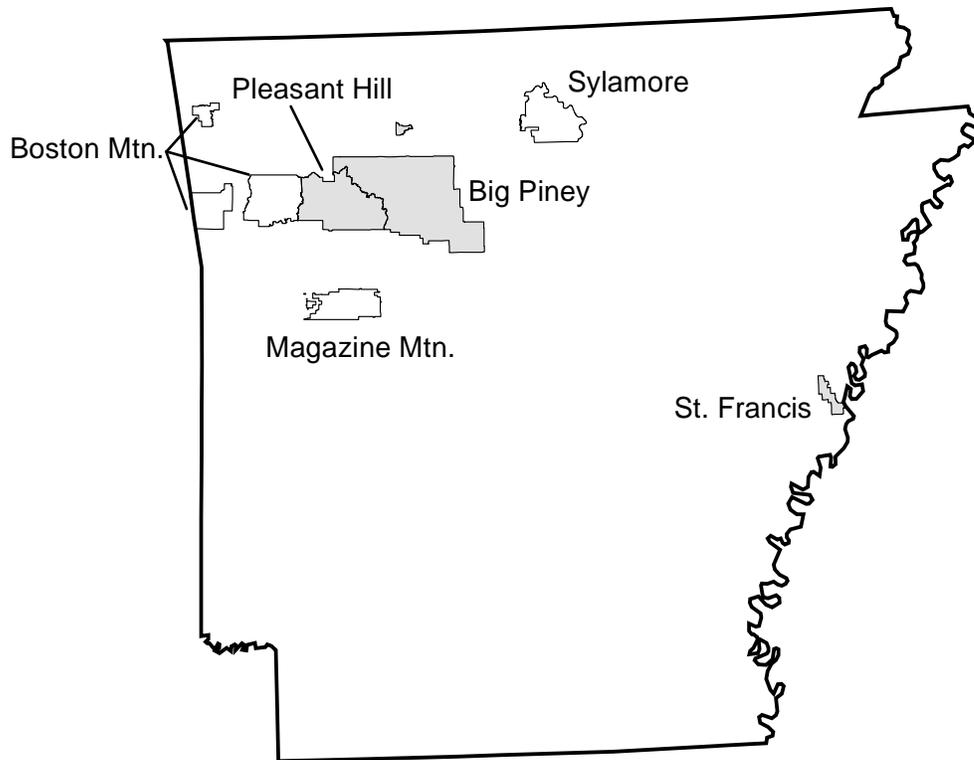


Figure 1. Ranger Districts on National Forest land in Arkansas. The CATT visited the Big Piney, Pleasant Hill, and St. Francis Ranger Districts (shaded in gray) in summer 2008.

Table 1. Summary of inventories by Ranger District or National Forest on the Ozark-St. Francis National Forest. Kilometers of habitat inventoried, number of NHD reaches visited, total number of inventories performed, and number of incomplete inventories on the Big Piney, Pleasant Hill, and St. Francis Ranger Districts, summer 2008. Incomplete inventories are due to dry streambed.

District or NF	Km	NHD Reaches	Total Inventories	Incomplete Inventories
Big Piney	37.7	24	5	2
Pleasant Hill	27.5	15	9	0
St. Francis	12.9	24	17	14
<i>Total</i>	<i>78.1</i>	<i>63</i>	<i>31</i>	<i>16</i>

Table 2. Summary of stream habitat inventories by 6<sup>th</sup> level hydrologic unit code (HUC). Kilometers of habitat inventoried, number of NHD reaches visited, total number of inventories performed, and number of incomplete inventories in 6th level HUCs on the Big Piney, Pleasant Hill, and St. Francis Ranger Districts, summer 2008. Incomplete inventories are due to dry streambed (see Table 3 comments for details).

District	6th Level HUC	Km Habitat Inventoried	NHD Reaches Visited	Total Inventories	Incomplete Inventories
Big Piney	111102020000	28.4	20	1	0
	111102020021	4.8	2	2	1
	111102020022	4.5	2	2	1
	<i>Total</i>	<i>37.7</i>	<i>24</i>	<i>5</i>	<i>2</i>
Pleasant Hill	111102020003	2.7	2	1	0
	111102020013	21.6	11	6	0
	111102020014	2.8	1	1	0
	111102020035	0.4	1	1	0
	<i>Total</i>	<i>27.5</i>	<i>15</i>	<i>9</i>	<i>0</i>
St. Francis	080201000001	5.2	8	7	6
	080201000010	1.0	4	2	2
	080202030022	3.4	4	4	3
	080202030050	1.3	2	1	0
	080202030054	0.5	1	1	1
	080202030188	1.6	5	2	2
	<i>Total</i>	<i>12.9</i>	<i>24</i>	<i>17</i>	<i>14</i>
<i>Grand Total</i>	<i>78.1</i>	<i>63</i>	<i>31</i>	<i>16</i>	

Table 3. Summary of stream habitat inventories by NHD reach. Reaches visited, kilometers of habitat inventoried, number of pools and riffles electrofished, and number of pebble inventories completed in NHD reaches on the Big Piney, Pleasant Hill, and St. Francis Ranger Districts, summer 2008.

District	6th Level HUC (NHD Reach)	Stream Name	Km Habitat Inventoried	# Pools Efished	# Riffles Efished	# Pebble Inventories	Comments
Big Piney RD	111102020000(57)	Middle Fork Illinois Bayou	3.9		1	1	
Big Piney RD	111102020000(58)	Middle Fork Illinois Bayou	1.0				
Big Piney RD	111102020000(59)	Middle Fork Illinois Bayou	0.5				
Big Piney RD	111102020000(60)	Middle Fork Illinois Bayou	7.1		1	1	
Big Piney RD	111102020000(61)	Middle Fork Illinois Bayou	1.1				
Big Piney RD	111102020000(62)	Middle Fork Illinois Bayou	1.1		1	1	
Big Piney RD	111102020000(63)	Middle Fork Illinois Bayou	2.5				
Big Piney RD	111102020000(67)	Middle Fork Illinois Bayou	0.5				
Big Piney RD	111102020000(68)	Middle Fork Illinois Bayou	0.5				
Big Piney RD	111102020000(69)	Middle Fork Illinois Bayou	0.3				
Big Piney RD	111102020000(72)	Middle Fork Illinois Bayou	0.1				
Big Piney RD	111102020000(73)	Middle Fork Illinois Bayou	1.4				
Big Piney RD	111102020000(74)	Middle Fork Illinois Bayou	2.4				
Big Piney RD	111102020000(75)	Middle Fork Illinois Bayou	0.4				
Big Piney RD	111102020000(76)	Middle Fork Illinois Bayou	0.1				
Big Piney RD	111102020000(77)	Middle Fork Illinois Bayou	1.6				
Big Piney RD	111102020000(78)	Middle Fork Illinois Bayou	0.8				
Big Piney RD	111102020000(79)	Middle Fork Illinois Bayou	1.2				
Big Piney RD	111102020000(80)	Middle Fork Illinois Bayou	1.3				
Big Piney RD	111102020000(81)	Middle Fork Illinois Bayou	0.5				
Big Piney RD	111102020021(50)	Unnamed	0.5				Dry
Big Piney RD	111102020021(85)	Meyer Branch	4.3	5	5	5	
Big Piney RD	111102020022(19)	Snow Creek	4.0	3	3	4	
Big Piney RD	111102020022(20)	Unnamed	0.5				Dry

Table 3. Continued.

District	6th Level HUC (NHD Reach)	Stream Name	Km Habitat Inventoried	# Pools Efished	# Riffles Efished	# Pebble Inventories	Comments
Pleasant Hill RD	111102020003(39)	East Fork Horsehead Creek	0.5	1	2	2	
Pleasant Hill RD	111102020003(41)	East Fork Horsehead Creek	2.3	2	2	2	
Pleasant Hill RD	111102020013(61)	Horsehead Creek	1.4	1	1	1	
Pleasant Hill RD	111102020013(62)	Horsehead Creek	1.7		1	1	
Pleasant Hill RD	111102020013(63)	Unnamed	3.1	2	2	2	
Pleasant Hill RD	111102020013(67)	Cove Creek	2.0	2	3	3	
Pleasant Hill RD	111102020013(76)	West Fork Horsehead Creek	4.2	2	4	4	
Pleasant Hill RD	111102020013(77)	West Fork Horsehead Creek	1.6	1	2	2	
Pleasant Hill RD	111102020013(78)	West Fork Horsehead Creek	0.1				
Pleasant Hill RD	111102020013(86)	Unnamed	1.8	2	2	2	
Pleasant Hill RD	111102020013(87)	Unnamed	0.8				
Pleasant Hill RD	111102020013(88)	Horsehead Creek	3.9	2	1	1	
Pleasant Hill RD	111102020013(90)	Unnamed	1.1	2	2	2	
Pleasant Hill RD	111102020014(12)	Unnamed	2.8	2	3	3	
Pleasant Hill RD	111102020035(10)	Unnamed	0.4	1	1	1	
St. Francis	080201000001(06)	Unnamed	0.6				Dry
St. Francis	080201000001(08)	Unnamed	0.5				Dry
St. Francis	080201000001(09)	Unnamed	0.6				Dry
St. Francis	080201000001(10)	Unnamed	0.6				Dry
St. Francis	080201000001(12)	Unnamed	0.6				
St. Francis	080201000001(13)	Unnamed	1.6				Dry with isolated pools
St. Francis	080201000001(14)	Unnamed	0.1				Dry
St. Francis	080201000001(15)	Unnamed	0.5				Dry
St. Francis	080201000010(18)	Unnamed	0.5				Dry

Table 3. Continued.

District	6th Level HUC (NHD Reach)	Stream Name	Km Habitat Inventoried	# Pools Efished	# Riffles Efished	# Pebble Inventories	Comments
St. Francis	080201000010(22)	Unnamed	0.2				Dry
St. Francis	080201000010(26)	Unnamed	0.1				Dry
St. Francis	080201000010(32)	Unnamed	0.2				Dry
St. Francis	080202030022(07)	Unnamed	0.5				Dry
St. Francis	080202030022(08)	Unnamed	0.5				Dry
St. Francis	080202030022(64)	Unnamed	0.5				Dry
St. Francis	080202030022(76)	Unnamed	1.9				Dry with isolated pools
St. Francis	080202030050(45)	Unnamed	1.0	2			Dry with isolated pools
St. Francis	080202030050(46)	Unnamed	0.3				Dry
St. Francis	080202030054(28)	Unnamed	0.5				Dry
St. Francis	080202030188(15)	Unnamed	0.6				Dry
St. Francis	080202030188(21)	Unnamed	0.1				Dry
St. Francis	080202030188(22)	Unnamed	0.3				Dry
St. Francis	080202030188(23)	Unnamed	0.1				Dry
St. Francis	080202030188(26)	Unnamed	0.5				Dry
<i>Grand Total</i>			<i>78.1</i>	<i>30</i>	<i>37</i>	<i>38</i>	

Table 4. Fish species captured on the Big Piney, Pleasant Hill, and St. Francis Ranger Districts, summer 2008 (see Table 3 for inventoried stream reaches).

Family	Scientific Name	Common Name	District		
			Big Piney	Pleasant Hill	St. Francis
Centrarchidae	<i>Lepomis cyanellus</i>	Green sunfish	X	X	X
Centrarchidae	<i>Lepomis macrochirus</i>	Bluegill		X	
Cyprinidae	<i>Campostoma anomalum</i>	Central stoneroller	X	X	
Cyprinidae	<i>Notemigonus crysoleucas</i>	Golden shiner			X
Cyprinidae	<i>Notropis boops</i>	Bigeye shiner	X		
Cyprinidae	<i>Notropis greenei</i>	Wedgespot shiner	X		
Cyprinidae	<i>Phoxinus erythrogaster</i>	Southern redbelly dace	X		
Cyprinidae	<i>Pimephales notatus</i>	Bluntnose minnow	X		
Cyprinidae	<i>Semotilus atromaculatus</i>	Creek chub	X	X	X
Ictaluridae	<i>Noturus exilis</i>	Slender madtom	X	X	
Percidae	<i>Etheostoma blennoides</i>	Greenside darter	X		
Percidae	<i>Etheostoma flabellare</i>	Fantail darter	X		
Percidae	<i>Etheostoma proeliare</i>	Cypress darter			X
Percidae	<i>Etheostoma spectabile</i>	Orangethroat darter	X	X	
Percidae	<i>Etheostoma whipplei</i>	Redfin darter	X	X	

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