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The Fishes of Wilson's Creek National Battlefield, Missouri, 2003

Prepared in cooperation with the
National Park Service

Scientific Investigations Report 2005-5127

U.S. Department of the Interior
U.S. Geological Survey

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The Fishes of Wilson's Creek National Battlefield, Missouri, 2003

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Abstract

An inventory of fishes of Wilson's Creek National Battlefield was conducted at eight sites on three streams, two springs, a pond, and within a cave. Fish were sampled using conventional electrofishing equipment during July 2003. Approximately 325 fish were collected and identified from five of the eight sampling sites. A total of 30 species of fish was collected from the eight sampling sites. The number of species collected at the sampling sites ranged from 0 to 23. Many of the "most commonly" collected fish species are typical of Ozark streams.

A preliminary expected species list incorrectly listed 12 species because of incorrect species range or habitat requirements. A thirteenth species (the Ozark cavefish, *Amblyopsis rosae*) is listed as "unexpected." However, this designation is uncertain because Ozark cavefish have been reported from several caves and springs in Greene County. Upon revising the list of expected species, the inventory yielded 30 of the 53 species (57 percent).

Ten of the 30 fish species collected in this inventory previously had not been collected at Wilson's Creek National Battlefield. However, eight species collected in one or more of the two previous inventories were not collected in this effort. It is unknown if any change in environmental conditions has occurred that is responsible for the absence of these species.

Although none of the species collected in this study are federally-listed threatened or endangered species, five species collected at Wilson's Creek National Battlefield may be of special interest to National Park Service managers and others because they are endemic to the Ozark Plateaus. The duskystripe shiner (*Luxilus pilsbryi*), Ozark bass (*Ambloplites constellatus*), Ozark chub (*Erimystax harryi*), and stippled darter (*Etheostoma punctulatum*) are common and found throughout much of the Ozark Plateaus. However, the Ozark sculpin (*Cottus hypselurus*) has a more limited range and more specific habitat requirements.

Introduction

The National Parks Omnibus Management Act (1998) facilitated a monitoring program that would allow National Park Service (NPS) employees to effectively monitor important selected natural resources located on parks managed by the NPS. The Heartland Network, a part of the NPS Inventory and Monitoring Program, is coordinating inventories of vascular plants and vertebrates in 15 parks in 8 midwestern States (Boetsch and others, 2000). Data collected over extended periods eventually will be evaluated to determine how biological communities are changing and to ensure that resources are being managed properly. To address this need, the U.S. Geological Survey, in cooperation with the NPS, Heartland Network, inventoried fishes of Wilson's Creek National Battlefield.

The purpose of this report is to provide the NPS with information related to fish species of the battlefield. This information includes a list of fish collected during an inventory of the fish species of the battlefield conducted during July 2003, relative abundance of each species at each collection site, and a revised list of expected species at the battlefield. Methods used to conduct the inventory also are described.

Carla Stark, Cristal Casler, and Tyler Cribbs of Wilson's Creek National Battlefield assisted with sampling of all sites. Carla Stark assisted by providing guidance related to sampling locations and access. Their assistance is gratefully acknowledged.

Description of Study Area

Wilson's Creek National Battlefield is located in the Springfield Plateau physiographic section (Fenneman, 1938) in southern Greene County about 5 miles southeast of Springfield, Missouri (fig. 1). The boundaries of Wilson's Creek National Battlefield include about 708.5 hectares (1,750 acres) (National Park Service, 2004).

Several streams, springs, and ponds occur within Wilson's Creek National Battlefield and include Wilsons Creek and two small tributaries (Shuyler Creek —locally known as Skeggs Branch, and McElhaney Branch). The headwaters of Wilsons Creek are in the city of Springfield; Wilsons Creek near the northern boundary of Wilson's Creek National Battlefield has a drainage area of about 58 square miles (Richards and Johnson, 2002). The city of Springfield's Southwest Wastewater Treatment Plant discharges into Wilsons Creek about 3 miles northwest of the northern boundary of the battlefield. Wilsons Creek flows into the James River about 1 mile south of the southern boundary of Wilson's Creek National Battlefield. The James River is a tributary of the White River.

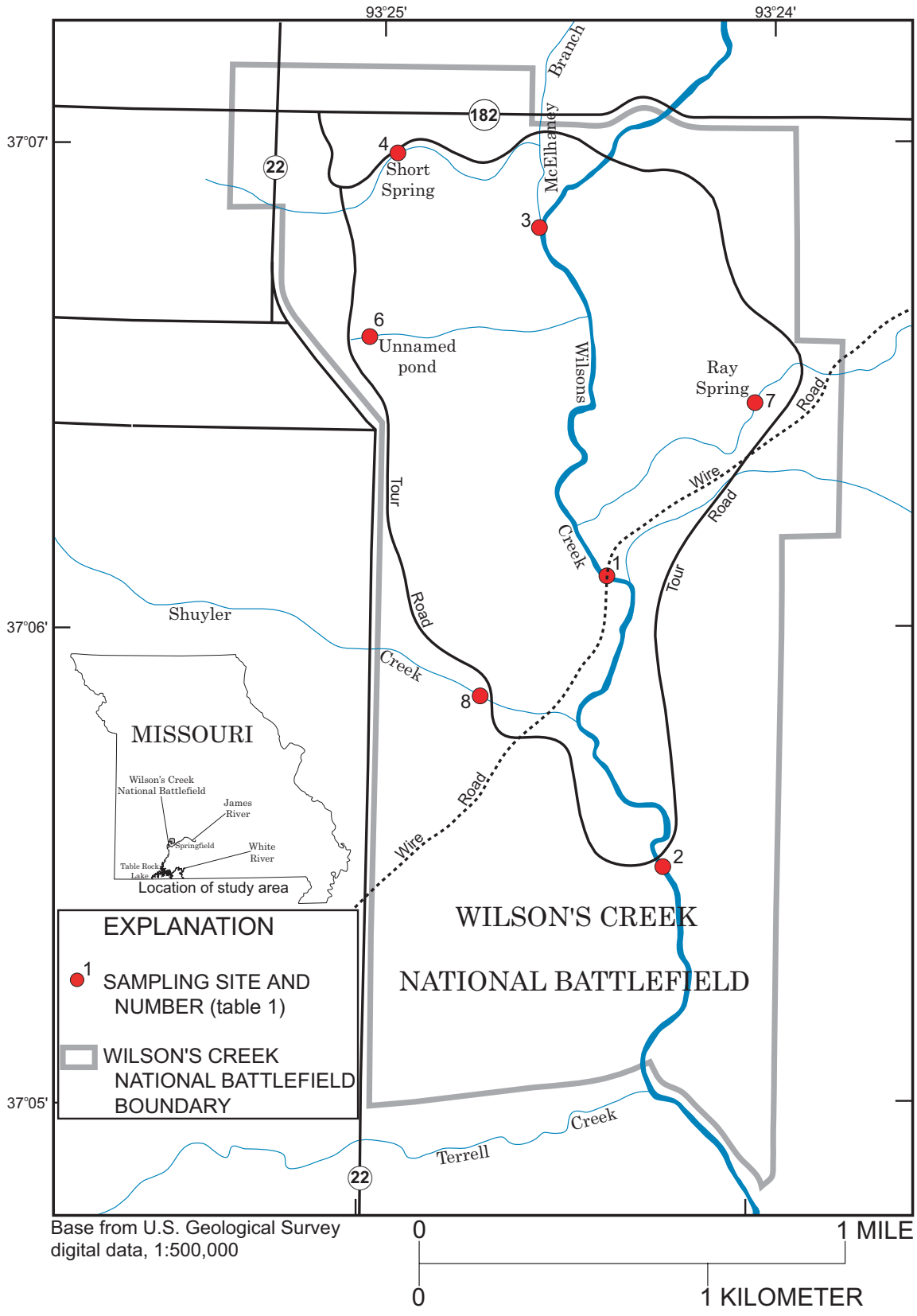

Figure 1. Location of sampling sites at Wilson's Creek National Battlefield.

Land use in the Wilsons Creek Basin upstream from the battlefield is primarily grassland and forest, but almost 40 percent of the basin is impervious or vegetated urban area (Richards and Johnson, 2002). A recent study of nutrients, bacteria, trace elements, and organic compounds in Wilsons Creek indicates that water quality and aquatic biota are being degraded by urban-derived contaminants (Richards and Johnson, 2002).

Methods

Fish were sampled at eight sites (fig. 1, table 1); two sites were located on Wilsons Creek. Single sites were located on Shuyler Creek, McElhaney Branch, Ray Spring, Short Spring, an unnamed pond, and within North Cave. The location of North Cave is not shown on figure 1 because of its sensitivity to disturbance. Prior to fish sampling in the streams, a sampling reach was designated. A military-issue global positioning system (GPS) unit utilizing the Precise Positioning Service (PPS, authorized to U.S. Federal Civilian Agencies by the Department of Defense) was used to obtain Universe Transverse Mercator (UTM) measurements according to North American Datum of 1983 (NAD83). UTM measurements were made at the upstream and downstream ends of the reach and at single points for sites that were not streams. Because the measurements were made with PPS, no correction to the position was necessary.

Fish were sampled using conventional electrofishing equipment. Stream size determined whether backpack, towed barge, or boat electrofishing equipment was used. The barge (supplemented by kick seining) was used at the upstream site on Wilsons Creek (at Wire Road) and the backpack and boat were used at the downstream site on Wilsons Creek. The backpack electrofishing equipment was used at all other sampling sites.

Small-mesh dipnets were used to collect fish incapacitated by the sampling equipment. Once fish had been netted, they were temporarily placed in a plastic bucket containing ambient stream water. After a brief sampling period (and partial sampling of the reach), fish in the bucket were identified using Robison and Buchanan (1988), Pflieger (1997), and Nelson and others (2004). Individuals generally were counted, however, numbers of some of the more abundant species were estimated at some sites. Fish that were not readily identifiable in the field were preserved for laboratory identification. Photographs were taken of each species collected, and specimens were released outside of the area being sampled. This process was repeated until the entire stream reach was sampled. The amount of time spent sampling and identifying fish at each site was recorded on the field sheets. Site-specific location and collecting information for all sampling efforts are provided in table 1.

Table 1. Site specific information for eight fish sampling sites within Wilson's Creek National Battlefield, 2003.

[EBS, electrofishing barge/seine combination; EBP, electrofishing backpack; EB, electrofishing boat; BPS, electrofishing backpack/seine combination; n/a, not applicable; E. easting; N, northing]

Site number (fig. 1) and name	Date	Reach length (meters)	Easting/Northing (upstream)[1]	Easting/Northing (downstream)	Gear	Estimated sampling time (minutes)
1 Wilsons Creek at Wire Road	07/14/03	225	0463728 E/ 04106418 N	0463878 E/ 04106244 N	EBS	160
2 Wilsons Creek at downstream tour road	07/16/03	250	0464037 E/ 04105188 N	0464096 E/ 04105244 N	EB/EBP	255
3 McElhaney Branch at mouth	07/15/03	20	0463601 E/ 04107563 N	n/a	EBP	5
4 Short Spring	07/15/03	30	0463040 E/ 04107876 N	n/a	EBP	25
5 North Cave	07/15/03	5	Not reported[2]	n/a	EBP	5
6 Unnamed pond	07/15/03	n/a	0462949 E/ 04107144 N	n/a	EBP	15
7 Ray Spring	07/15/03	10	0464430 E/ 04106891 N	n/a	EBP	15
8 Shuyler Creek upstream from tour road	07/15/03	150	0463273 E/ 04105832 N	0463435 E/ 04105738 N	BPS	90

[1]The horizontal datum used for obtaining Universe Transverse Mercator (UTM) measurements was North American Datum of 1983 (NAD83).
[2]The location of North Cave is not reported because of its sensitivity to disturbance.

Fish species collected also are classified according to how common they occurred in this study. Criteria for this classification were based on percent relative abundance and were as follows: most common—greater than 20.0 percent, common—10.0 to 20.0 percent, least common—2.0 to 10.0 percent, and rare—less than 2.0 percent, and not collected.

At the onset of the study, the NPS provided the USGS with a preliminary list of fish (Boetsch and others, 2000) (based on county records provided by Julie Fleming, Missouri Department of Conservation in August 2003) that were suspected to occur at Wilson's Creek National Battlefield. This list was provided with the intent that the USGS would make revisions that would result in a more accurate list of fish species that could reasonable be expected to occur at Wilson's Creek National Battlefield and was to be used as a guide to determine if 90 percent of those species reasonably expected to occur at the battlefield had been documented. The preliminary list included some fish that probably do not occur at Wilson's Creek National Battlefield because the battlefield is outside of the species' range, or the aquatic habitats in Wilson's Creek National Battlefield are not representative of the typical habitat for the species. After reviewing the literature and environmental settings at Wilson's Creek National Battlefield, the list was revised to better reflect species that have been collected and could occur at Wilson's Creek National Battlefield.

Fishes of Wilson's Creek National Battlefield

Approximately 325 fish were collected from eight sampling sites. A total of 30 species of fish was collected from five of the eight sampling sites; no fish were collected from three sites (tables 2-4). The number of species collected at the sampling sites ranged from 0 (at one of the springs, a pond, and at North Cave) to 23 at the downstream site on Wilsons Creek.

Several species were classified as "most common" at one or more sites. Most of the fish species collected most commonly at stream sites are typical of Ozark streams. Because of the range of habitats sampled and varying habitat preferences of species collected at Wilson's Creek National Battlefield, the numerically dominant species often were different at the different sites. Black redhorse (*Moxostoma duquesnei*), golden redhorse (*Moxostoma erythrurum*), and central stonerollers (*Campostoma anomalum*) were the "most common" species at the sites on Wilsons Creek. The southern redbelly dace (*Phoxinus erythrogaster*) was one of the "most common" species at the sites on Shuyler Creek and McElhaney Branch; western mosquitofish (*Gambusia affinis*) was the other "most common" species at the McElhaney Branch site (table 4). Bluegill (*Lepomis macrochirus*) was the only species collected from Ray Spring.

Ten species were collected at a single site and were classified as "rare" or "least common" at that site (table 4). Most of these species were found only at the downstream site on Wilsons Creek.

The preliminary expected species list incorrectly listed 12 species because of incorrect species range or habitat requirements. A thirteenth species (the Ozark cavefish) is listed as "unexpected." However, this designation is uncertain because Ozark cavefish have been reported from several caves and springs in Greene County (Pflieger, 1977). Upon revising the list of expected species, the inventory yielded 30 of the 53 species (57 percent) (table 5). Twenty-three additional species not collected in 2003 may occur at Wilson's Creek National Battlefield for two primary reasons—because the species had been collected previously at the battlefield or because the battlefield occurs within the known species range and habitats found at the battlefield are suitable for the species.

Relation of Fishes to Habitats and Distributional Ranges

The three most common species at one or more sites on Wilsons Creek (black redhorse, golden redhorse, and central stone-rollers) are typical of some habitats found in streams of Wilson's Creek National Battlefield. Central stonerollers are one of the most abundant species in many streams of the Ozark Plateaus (Pflieger, 1997) and, along with largescale stonerollers (*Campostoma oligolepis*), are often most abundant in nutrient-enriched Ozark streams (Petersen, 1998; 2004). Black and golden redhorse are common fish in Ozark streams (Pflieger, 1997), but Petersen (2004) reported relative abundance values that typically were less than 3 percent for several streams in north-central Arkansas.

The southern redbelly dace, which was one of the "most common" species at the sites on Shuyler Creek and McElhaney Branch, is typical of habitats in the smaller streams of Wilson's Creek National Battlefield. Southern redbelly dace often are a common fish in small, springfed streams such as the smaller streams of Wilson's Creek National Battlefield (Pflieger, 1997).

Western mosquitofish and bluegill were "most common" species at two sites. Both sites were very small areas that were sampled briefly and yielded few individuals. Western mosquitofish prefer shallow water with almost no current (Pflieger, 1997) such as the habitat at the mouth of McElhaney Branch. It is unlikely that the four bluegills collected at Ray Spring were part of a reproducing population.

Ten species were collected at single sites and were classified as "rare" or "least common" at that site (table 4). Most of these species were found only at the downstream site on Wilsons Creek. All of these species (except the gizzard shad, *Dorosoma cepedianum,* and the yellow bullhead, *Ameiurus natalis)* typically are fairly common in Ozark streams in the Greene County area, although the orangethroat darter typically prefers headwater creeks to larger creeks (Pflieger, 1997). Most species were represented by three or less individuals.

Several species on the preliminary list of species expected to occur at Wilson's Creek National Battlefield were not collected during 2003 and many of these species are unlikely to be found within Wilson's Creek National Battlefield (for reasons

Table 2. Number of fish collected at sampling sites within Wilson's Creek National Battlefield, 2003.

[--, not collected; E, estimated; X, present, but not counted]

Common name	Scientific name	Wilsons Creek at Wire Road	Wilsons Creek at downstream tour road	Shuyler Creek upstream from tour road	McElhaney Branch at mouth	Ray Spring	Short Spring	Unnamed pond	North Cave
Banded darter	*Etheostoma zonale*	--	3	--	--	--	--	--	--
Banded sculpin	*Cottus carolinae*	12	7	X	--	--	--	--	--
Black redhorse	*Moxostoma duquesnei*	2	E41	--	2	--	--	--	--
Blackspotted topminnow	*Fundulus olivaceus*	3	1	--	--	--	--	--	--
Bluegill	*Lepomis macrochirus*	--	3	--	--	4	--	--	--
Bluntnose minnow	*Pimephales notatus*	1	--	--	--	--	--	--	--
Central stoneroller	*Campostoma anomalum*	E34	16	X	--	--	--	--	--
Channel catfish	*Ictalurus punctatus*	2	4	--	--	--	--	--	--
Creek chub	*Semotilus atromaculatus*	3	1	1	1	--	--	--	--
Duskystripe shiner	*Luxilus pilsbryi*	10	E31	2	2	--	--	--	--
Gizzard shad	*Dorosoma cepedianum*	--	3	--	--	--	--	--	--
Golden redhorse	*Moxostoma erythrurum*	4	E49	--	--	--	--	--	--
Green sunfish	*Lepomis cyanellus*	3	1	--	--	--	--	--	--
Greenside darter	*Etheostoma blennioides*	4	12	--	--	--	--	--	--
Logperch	*Percina caprodes*	7	--	--	--	--	--	--	--
Longear sunfish	*Lepomis megalotis*	18	6	--	--	--	--	--	--
Northern hog sucker	*Hypentelium nigricans*	4	3	--	--	--	--	--	--
Orangethroat darter	*Etheostoma spectabile*	--	--	3	--	--	--	--	--
Ozark bass	*Ambloplites constellatus*	2	3	--	--	--	--	--	--
Ozark chub	*Erimystax harryi*	--	1	--	--	--	--	--	--
Ozark minnow	*Notropis nubilis*	--	1	--	--	--	--	--	--
Ozark sculpin	*Cottus hypselurus*	--	3	2	--	--	--	--	--
Rainbow darter	*Etheostoma caeruleum*	10	1	--	--	--	--	--	--
Smallmouth bass	*Micropterus dolomieu*	1	3	--	--	--	--	--	--
Southern redbelly dace	*Phoxinus erythrogaster*	1	--	X	3	--	--	--	--
Stippled darter	*Etheostoma punctulatum*	1	--	3	--	--	--	--	--
Striped shiner	*Luxilus chrysocephalus*	--	2	--	--	--	--	--	--
Telescope shiner	*Notropis telescopus*	--	2	--	--	--	--	--	--
Western mosquitofish	*Gambusia affinis*	--	--	--	4	--	--	--	--
Yellow bullhead	*Ameiurus natalis*	3	--	--	--	--	--	--	--
Number of species collected		20	23	8	5	1	0	0	0
Number of individuals collected		E125	E197	--	12	4	0	0	0

Table 3. Percent relative abundance of fish collected at five sampling sites within Wilson's Creek National Battlefield, 2003

[--, not collected; E, estimated; <, less than; >, greater than]

Common name	Scientific name	Wilsons Creek at Wire Road	Wilsons Creek at downstream tour road	Shuyler Creek upstream from tour road	McElhaney Branch at mouth	Ray Spring
Banded darter	*Etheostoma zonale*	--	1.52	--	--	--
Banded sculpin	*Cottus carolinae*	9.60	3.55	10-20	--	--
Black redhorse	*Moxostoma duquesnei*	1.60	E20.81	--	16.67	--
Blackspotted topminnow	*Fundulus olivaceus*	2.40	0.51	--	--	--
Bluegill	*Lepomis macrochirus*	--	1.52	--	--	100.00
Bluntnose minnow	*Pimephales notatus*	0.80	--	--	--	--
Central stoneroller	*Campostoma anomalum*	27.20	8.12	10-20	--	--
Channel catfish	*Ictalurus punctatus*	1.60	2.03	0.00	--	--
Creek chub	*Semotilus atromaculatus*	2.40	0.51	<2	8.33	--
Duskystripe shiner	*Luxilus pilsbryi*	8.00	E15.74	<10	16.67	--
Gizzard shad	*Dorosoma cepedianum*	--	1.52	--	--	--
Golden redhorse	*Moxostoma erythrurum*	3.20	E24.87	--	--	--
Green sunfish	*Lepomis cyanellus*	2.40	0.51	--	--	--
Greenside darter	*Etheostoma blennioides*	3.20	6.09	--	--	--
Logperch	*Percina caprodes*	5.60	0.00	--	--	--
Longear sunfish	*Lepomis megalotis*	14.40	3.05	--	--	--
Northern hog sucker	*Hypentelium nigricans*	3.20	1.52	--	--	--
Orangethroat darter	*Etheostoma spectabile*	--	--	<10	--	--
Ozark bass	*Ambloplites constellatus*	1.60	1.52	--	--	--
Ozark chub	*Erimystax harryi*	--	0.51	--	--	--
Ozark minnow	*Notropis nubilis*	--	0.51	--	--	--
Ozark sculpin	*Cottus hypselurus*	--	1.52	<10	--	--
Rainbow darter	*Etheostoma caeruleum*	8.00	0.51	--	--	--
Smallmouth bass	*Micropterus dolomieu*	0.80	1.52	--	--	--
Southern redbelly dace	*Phoxinus erythrogaster*	0.80	--	>20	25.00	--
Stippled darter	*Etheostoma punctulatum*	0.80	--	<10	--	--
Striped shiner	*Luxilus chrysocephalus*	--	1.02	--	--	--
Telescope shiner	*Notropis telescopus*	--	1.02	--	--	--
Western mosquitofish	*Gambusia affinis*	--	--	--	33.33	--
Yellow bullhead	*Ameiurus natalis*	2.40	--	--	--	--

Table 4. Abundance classification of fish collected at five sampling sites within Wilson's Creek National Battlefield, 2003.

[MC, most common (greater than 20.0 percent); C, common (10.0 to 20.0 percent); LC, least common (2.0 to 10.0 percent); R, rare (less than 2.0 percent); --, not collected; based on relative abundance and semiquantitative sampling]

Common name	Scientific name	Wilsons Creek at Wire Road	Wilsons Creek at downstream tour road	Shuyler Creek upstream from tour road	McElhaney Branch at mouth	Ray Spring
Banded darter	*Etheostoma zonale*	--	R	--	--	--
Banded sculpin	*Cottus carolinae*	LC	LC	C	--	--
Black redhorse	*Moxostoma duquesnei*	R	MC	--	C	--
Blackspotted topminnow	*Fundulus olivaceus*	LC	R	--	--	--
Bluegill	*Lepomis macrochirus*	--	R	--	--	MC
Bluntnose minnow	*Pimephales notatus*	R	--	--	--	--
Central stoneroller	*Campostoma anomalum*	MC	LC	C	--	--
Channel catfish	*Ictalurus punctatus*	R	LC	--	--	--
Creek chub	*Semotilus atromaculatus*	LC	R	R	LC	--
Duskystripe shiner	*Luxilus pilsbryi*	LC	C	LC	C	--
Gizzard shad	*Dorosoma cepedianum*	--	R	--	--	--
Golden redhorse	*Moxostoma erythrurum*	LC	MC	--	--	--
Green sunfish	*Lepomis cyanellus*	LC	R	--	--	--
Greenside darter	*Etheostoma blennioides*	LC	LC	--	--	--
Logperch	*Percina caprodes*	LC	--	--	--	--
Longear sunfish	*Lepomis megalotis*	C	LC	--	--	--
Northern hog sucker	*Hypentelium nigricans*	LC	R	--	--	--
Orangethroat darter	*Etheostoma spectabile*	--	--	LC	--	--
Ozark bass	*Ambloplites constellatus*	R	R	--	--	--
Ozark chub	*Erimystax harryi*	--	R	--	--	--
Ozark minnow	*Notropis nubilis*	--	R	--	--	--
Ozark sculpin	*Cottus hypselurus*	--	R	LC	--	--
Rainbow darter	*Etheostoma caeruleum*	LC	R	--	--	--
Smallmouth bass	*Micropterus dolomieu*	R	R	--	--	--
Southern redbelly dace	*Phoxinus erythrogaster*	R	--	MC	MC	--
Stippled darter	*Etheostoma punctulatum*	R	--	LC	--	--
Striped shiner	*Luxilus chrysocephalus*	--	R	--	--	--
Telescope shiner	*Notropis telescopus*	--	R	--	--	--
Western mosquitofish	*Gambusia affinis*	--	--	--	MC	--
Yellow bullhead	*Ameiurus natalis*	LC	--	--	--	--

described in Pflieger, 1997) (table 5). Nine of the species do not occur in the White River Basin. Paddlefish (*Polydon spathula*) typically occur in larger streams (including the James River) and rainbow trout (*Oncorhyncus mykiss*) prefer the cool water of deep reservoirs and springfed streams. Goldfish (*Carassius auratus*) are present throughout Missouri as stray individuals, but they are unlikely to persist within the battlefield. Bigeye chubs (*Hybopsis amblops*) probably have been extirpated from the James River Basin. The Ozark cavefish is listed as "unexpected" because of its rarity, although it has been reported from several caves and springs in Greene County.

Comparison to Past Inventories

Some differences existed between the assemblages (groups of species) collected in 2003 and during previous inventories (table 6). Ten of the 30 fish species collected in this inventory previously had not been collected at Wilson's Creek National Battlefield. Eight species collected from Wilson's Creek National Battlefield in 1988 and 1989 were not collected in 2003, even though suitable habitat is present. These species are the bigeye shiner, black bullhead (*Ameiurus melas*), carmine shiner (*Notropis percobromus*), common carp (*Cyprinus carpio*), fantail darter (*Etheostoma flabellare*), largemouth bass (*Micropterus salmoides*), largescale stoneroller, and white sucker (*Catostomus commersoni*) (National Park Service, 1989; Hoefs and Boyle, 1990). Largescale stonerollers were not identified among the collected stonerollers in 2003; however, young individuals of the two species can be virtually impossible to distinguish (Robison and Buchanan 1988). However, largescale stonerollers have been collected from several sites near Springfield (Pflieger, 1997). It is unknown if any change in environmental conditions has occurred that is responsible for the absence of these species (several of which are relatively tolerant of impaired environmental conditions).

Table 5. List of fish species expected to occur at Wilson's Creek National Battlefield.

[Preliminary list, list provided by National Park Service; Revised list, list compiled by USGS after review of pertinent literature; USGS, collected by USGS in 2003; 0, unexpected, park is outside of species' range or lacks appropriate habitat; 1, species is expected within park; ?, uncertain; 2, collected. Comments based on information from Pflieger (1997)]

Family name	Scientific name	Common name	Preliminary list	Revised list	USGS	Comment
Amblyopsidae	*Amblyopsis rosae*	Ozark cavefish	1	0?	No	Reported from nearby cave
Atherinidae	*Labidesthes sicculus*	Brook silverside	1	1	No	
Catostomidae	*Moxostoma duquesnei*	Black redhorse	1	2	Yes	
Catostomidae	*Erimyzon oblongus*	Creek chubsucker	1	1	No	
Catostomidae	*Moxostoma erythrurum*	Golden redhorse	1	2	Yes	
Catostomidae	*Hypentelium nigricans*	Northern hog sucker	1	2	Yes	
Catostomidae	*Moxostoma carinatum*	River redhorse	1	1	No	
Catostomidae	*Catostomus commersoni*	White sucker	1	1	No	
Centrarchidae	*Lepomis macrochirus*	Bluegill	1	2	Yes	
Centrarchidae	*Lepomis cyanellus*	Green sunfish	1	2	Yes	
Centrarchidae	*Micropterus salmoides*	Largemouth bass	1	1	No	
Centrarchidae	*Lepomis megalotis*	Longear sunfish	1	2	Yes	
Centrarchidae	*Ambloplites constellatus*	Ozark bass	1	2	Yes	
Centrarchidae	*Micropterus dolomieu*	Smallmouth bass	1	2	Yes	
Centrarchidae	*Micropterus punctulatus*	Spotted bass	1	1	No	
Clupeidae	*Dorosoma cepedianum*	Gizzard shad	1	2	Yes	
Cottidae	*Cottus carolinae*	Banded sculpin	1	2	Yes	
Cottidae	*Cottus bairdi*	Mottled sculpin	1	0	No	Not in White River Basin
Cottidae	*Cottus hypselurus*	Ozark sculpin	1	2	Yes	
Cyprinidae	*Hybopsis amblops*	Bigeye chub	1	0	No	Probably extirpated
Cyprinidae	*Notropis boops*	Bigeye shiner	1	1	No	
Cyprinidae	*Luxilus zonatus*	Bleeding shiner	1	0	No	Not in White River Basin
Cyprinidae	*Pimephales notatus*	Bluntnose minnow	1	2	Yes	
Cyprinidae	*Notropis percobromus*	Carmine shiner	1	1	No	
Cyprinidae	*Campostoma anomalum*	Central stoneroller	1	2	Yes	
Cyprinidae	*Cyprinus carpio*	Common carp	1	1	No	

Table 5. List of fish species expected to occur at Wilson's Creek National Battlefield.—Continued

[Preliminary list, list provided by National Park Service; Revised list, list compiled by USGS after review of pertinent literature; USGS, collected by USGS in 2003; 0, unexpected, park is outside of species' range or lacks appropriate habitat; 1, species is expected within park; ?, uncertain; 2, collected. Comments based on information from Pflieger (1997)]

Family name	Scientific name	Common name	Preliminary list	Revised list	USGS	Comment
Cyprinidae	*Semotilus atromaculatus*	Creek chub	1	2	Yes	
Cyprinidae	*Luxilus pilsbryi*	Duskystripe shiner	1	2	Yes	
Cyprinidae	*Pimephales promelas*	Fathead minnow	1	1	No	
Cyprinidae	*Carassius auratus*	Goldfish	1	0	No	Unlikely except as strays
Cyprinidae	*Nocomis biguttatus*	Hornyhead chub	1	1	No	
Cyprinidae	*Campostoma oligolepis*	Largescale stoneroller	1	1	No	
Cyprinidae	*Erimystax harryi*	Ozark chub	1	2	Yes	
Cyprinidae	*Notropis nubilus*	Ozark minnow	1	2	Yes	
Cyprinidae	*Cyprinella lutrensis*	Red shiner	1	0	No	Not in White River Basin
Cyprinidae	*Lythrurus umbratilis*	Redfin shiner	1	0	No	Not in White River Basin
Cyprinidae	*Notropis ludibundus*	Sand shiner	1	0	No	Not in White River Basin
Cyprinidae	*Phoxinus erythrogaster*	Southern redbelly dace	1	2	Yes	
Cyprinidae	*Luxilus chrysocephalus*	Striped shiner	1	2	Yes	
Cyprinidae	*Notropis telescopus*	Telescope shiner	1	2	Yes	
Cyprinidae	*Cyprinella galactura*	Whitetail shiner	1	1	No	
Fundulidae	*Fundulus olivaceus*	Blackspotted topminnow	1	2	Yes	
Fundulidae	*Fundulus catenatus*	Northern studfish	1	1	No	
Ictaluridae	*Ameiurus melas*	Black bullhead	1	1	No	
Ictaluridae	*Ictalurus punctatus*	Channel catfish	1	2	Yes	
Ictaluridae	*Noturus flavater*	Checkered madtom	1	1	No	
Ictaluridae	*Pylodictis olivaris*	Flathead catfish	1	1	No	
Ictaluridae	*Noturus albater*	Ozark madtom	1	1	No	
Ictaluridae	*Noturus exilis*	Slender madtom	1	1	No	
Ictaluridae	*Ameiurus natalis*	Yellow bullhead	1	2	Yes	
Lepisosteidae	*Lepisosteus osseus*	Longnose gar	1	1	No	
Percidae	*Etheostoma zonale*	Banded darter	1	2	Yes	
Percidae	*Etheostoma flabellare*	Fantail darter	1	1	No	
Percidae	*Etheostoma blennioides*	Greenside darter	1	2	Yes	
Percidae	*Etheostoma nigrum*	Johnny darter	1	0	No	Not in White River Basin
Percidae	*Etheostoma microperca*	Least darter	1	0	No	Not in White River Basin
Percidae	*Percina caprodes*	Logperch	1	2	Yes	
Percidae	*Etheostoma tetrazonum*	Missouri saddled darter	1	0	No	Not in White River Basin
Percidae	*Etheostoma nianguae*	Niangua darter	1	0	No	Not in White River Basin
Percidae	*Etheostoma spectabile*	Orangethroat darter	1	2	Yes	
Percidae	*Etheostoma caeruleum*	Rainbow darter	1	2	Yes	
Percidae	*Etheostoma stigmaeum*	Speckled darter	1	1	No	
Percidae	*Etheostoma punctulatum*	Stippled darter	1	2	Yes	
Percidae	*Etheostoma juliae*	Yoke darter	1	1	No	
Poeciliidae	*Gambusia affinis*	Western mosquitofish	1	2	Yes	
Polyodontidae	*Polyodon spathula*	Paddlefish	1	0	No	Prefers large rivers (present in James River)
Salmonidae	*Oncorhynchus mykiss*	Rainbow trout	1	0	No	Prefers cooler water

Table 6. List of fish collected in three inventories at Wilson's Creek National Battlefield.

[--, not collected; X, present]

Common name	Scientific name	This study	Hoefs and Boyle (1990)	National Park Service (1989)
Banded darter	*Etheostoma zonale*	X	X	--
Banded sculpin	*Cottus carolinae*	X	X	X
Bigeye shiner	*Notropis boops*	--	X	X
Black bullhead	*Ameiurus melas*	--	X	X
Black redhorse	*Moxostoma duquesnei*	X	X	X
Blackspotted top-minnow	*Fundulus olivaceus*	X	X	X
Bluegill	*Lepomis macrochirus*	X	X	X
Bluntnose minnow	*Pimephales notatus*	X	X	X
Carmine shiner[1]	*Notropis percobromus*	--	X	--
Central stoneroller	*Campostoma anomalum*	X	X	X
Channel catfish	*Ictalurus punctatus*	X	X	X
Common carp	*Cyprinus carpio*	--	X	X
Creek chub	*Semotilus atromaculatus*	X	--	X
Duskystripe shiner	*Luxilus pilsbryi*	X	X	X
Fantail darter	*Etheostoma flabellare*	--	X	--
Gizzard shad	*Dorosoma cepedianum*	X	--	--
Golden redhorse	*Moxostoma erythrurum*	X	X	X
Green sunfish	*Lepomis cyanellus*	X	X	X
Greenside darter	*Etheostoma blennioides*	X	X	X
Largemouth bass	*Micropterus salmoides*	--	X	X
Largescale stoneroller	*Campostoma oligolepis*	--	--	X
Logperch	*Percina caprodes*	X	X	X
Longear sunfish	*Lepomis megalotis*	X	X	X
Northern hog sucker	*Hypentelium nigricans*	X	X	X
Orangethroat darter	*Etheostoma spectabile*	X	--	--
Ozark bass	*Ambloplites constellatus*	X	--	--
Ozark chub	*Erimystax harryi*	X	--	--
Ozark minnow	*Notropis nubilis*	X	X	X
Ozark sculpin	*Cottus hypselurus*	X	X	X
Rainbow darter	*Etheostoma caeruleum*	X	--	--
Smallmouth bass	*Micropterus dolomieu*	X	--	--
Southern redbelly dace	*Phoxinus erythrogaster*	X	X	X
Stippled darter	*Etheostoma punctulatum*	X	--	--
Striped shiner	*Luxilus chrysocephalus*	X	--	--
Telescope shiner	*Notropis telescopus*	X	--	--
Western mosquitofish	*Gambusia affinis*	X	--	--
White sucker	*Catostomus commersoni*	--	X	X
Yellow bullhead	*Ameiurus natalis*	X	X	X
Total number of species		30	26	25

[1]Formerly referred to as rosyface shiner (*Notropis percobromus*).

Species of Interest

Although none of the species collected in this study are federally-listed threatened or endangered species (U.S. Fish and Wildlife Service, 2004), five species collected at Wilson's Creek National Battlefield may be of special interest to NPS managers and others. The duskystripe shiner, Ozark bass, Ozark chub, Ozark sculpin, and stippled darter are endemic to the Ozark Plateaus of Missouri, Arkansas, and Oklahoma. Most of these species are common and found throughout much of the Ozark Plateaus. However, the Ozark sculpin has a more limited range and more specific habitat requirements. The Ozark sculpin is found primarily in the White River Basin of Missouri and Arkansas (Robison and Buchanan, 1988; Pflieger, 1997). The Ozark sculpin prefers coldwater habitats such as spring branches (Pflieger, 1997); a few individuals were collected from Schuyler Branch and Wilsons Creek. Data indicate that Ozark sculpin are among the least common species in Schuyler Branch and that they are rare in Wilsons Creek.

Summary

An inventory of fishes of Wilson's Creek National Battlefield was conducted at eight sites on three streams, two springs, a pond, and within a cave. Fish were sampled using conventional electrofishing equipment during July 2003. Stream size determined whether backpack, towed barge, or boat electrofishing equipment was used. The barge (supplemented by kick seining) was used at the upstream site on Wilsons Creek and the backpack and boat were used at the downstream site on Wilsons Creek. The backpack electrofishing equipment was used at all other sampling sites. Approximately 325 fish were collected from the eight sampling sites. A total of 30 species of fish was collected from five of the eight sampling sites; no fish were collected from three sites. The number of species collected at the sampling sites ranged from 0 (at one of the springs, a pond, and at North Cave) to 23 at the downstream site on Wilsons Creek. Many of the "most commonly" collected fish species at stream sites (black redhorse, golden redhorse, central stoneroller, southern redbelly dace, western mosquitofish, and bluegill) are typical of Ozark streams.

A preliminary expected species list incorrectly listed 12 species because of incorrect species range or habitat requirements. A thirteenth species (the Ozark cavefish) is listed as "unexpected." However, this designation is uncertain because Ozark cavefish have been reported from several caves and springs in Greene County. Upon revising the list of expected species, the inventory yielded 30 of the 53 species (57 percent).

Ten of the 30 fish species collected in this inventory previously had not been collected at Wilson's Creek National Battlefield. However, eight species collected in one or more of the two previous inventories were not collected in this effort. It is unknown if any change in environmental conditions has occurred that is responsible for the absence of these species (several of which are relatively tolerant of impaired environmental conditions).

Although none of the species collected in this study are federally-listed threatened or endangered species, five species collected at Wilson's Creek National Battlefield may be of special interest to NPS managers and others because they are endemic to the Ozark Plateaus. The duskystripe shiner, Ozark bass, Ozark chub, and stippled darter are common and found throughout much of the Ozark Plateaus. However, the Ozark sculpin has a more limited range and more specific habitat requirements.

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