

The Fishes of Buffalo National River, Arkansas, 2001-2003

Prepared in cooperation with the
National Park Service

Scientific Investigations Report 2005-5130

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

The Fishes of Buffalo National River, Arkansas, 2001-2003

By James C. Petersen and B.G. Justus

Prepared in cooperation with the
National Park Service

Scientific Investigations Report 2005-5130

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

U.S. Department of the Interior
Gale A. Norton, Secretary

U.S. Geological Survey
P. Patrick Leahy, Acting Director

U.S. Geological Survey, Reston, Virginia: 2005

For sale by U.S. Geological Survey, Information Services
Box 25286, Denver Federal Center
Denver, CO 80225

For more information about the USGS and its products:
Telephone: 1-888-ASK-USGS
World Wide Web: <http://www.usgs.gov/>

Any use of trade, product, or firm names in this publication is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Although this report is in the public domain, permission must be secured from the individual copyright owners to reproduce any copyrighted materials contained within this report.

Contents

Abstract.....	1
Introduction	1
Purpose and Scope	3
Acknowledgments	3
Description of Study Area.....	3
Methods.....	3
Fishes of Buffalo National River	5
Relation of Fishes to Habitats and Distributional Ranges	6
Comparison to Past Inventories	6
Species of Interest.....	7
Summary.....	7
References	8

Figures

1. Map showing location of sampling sites, Buffalo National River, Arkansas	2
---	---

Tables

1. List of sites and locations for Buffalo National River, Arkansas.....	4
2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.....	9
3. List of species codes used in table 2	27
4. List of species collected within Buffalo National River, Arkansas	28
5. Qualitative abundance of species at sites sampled in 2003 where all encountered species were collected, Buffalo National River, Arkansas	30
6. List of collected species at sites sampled in 2003 where only selected species were collected, Buffalo National River, Arkansas	31
7. List of fish species expected to occur at Buffalo National River, Arkansas	33

The Fishes of Buffalo National River, Arkansas, 2001-2003

By James C. Petersen and B.G. Justus

Abstract

During June through September 2001 and 2002, extensive fish community sampling was conducted at 29 sites within the boundaries of Buffalo National River. Samples were collected using backpack, tote barge, and boat electrofishing equipment. Kick seining also was used at all sites. To supplement these results, samples were collected in 2003 from less typical habitats and during other seasons of the year. Ten supplemental samples were collected from the Buffalo River and five samples were collected from tributaries of the Buffalo River.

During the 3 years of sampling, 66 species of fish were collected or observed from the 42 sampling sites. Stonerollers, duskystripe shiners, longear sunfish, and rainbow darters were among the more abundant fish species at most sites. Each of these species is common and abundant throughout much of the Ozark Plateaus in creeks and small rivers. Other species (for example, banded sculpin, southern redbelly dace, orangethroat darter, and Ozark minnow) were among the more abundant species at other sites. These species prefer small- to medium-sized, springfed streams or small creeks.

A preliminary list of species expected to occur at Buffalo National River provided by the National Park Service incorrectly listed 47 species because of incorrect species range or habitat requirements. Upon revising this list, the inventory yielded 66 of the 78 species (85 percent). Twelve additional species not collected in 2001-2003 may occur at Buffalo National River for two primary reasons--because the species had been collected previously at the park, or because the park occurs within the known species range and habitats found at the park are suitable for the species.

Although no fish species collected from Buffalo National River are federally-listed threatened or endangered species, several species collected at Buffalo National River may be of special interest to National Park Service managers and others. Ten species are endemic to the Ozark Plateaus area and most of these ten are restricted to the White River Basin. For some species the Buffalo River is a population stronghold. The yoke darter and Ozark bass are especially abundant in the Buffalo River. In Arkansas, the Ozark shiner is most abundant in the Buffalo River and, although populations of Ozark shiners are declining in Arkansas, this is not typically the case in the Buffalo River. Data from 2001-2003 indicate that gilt darters cur-

rently (2005) are less common in the Buffalo River than during the 1970's. Populations of channel catfish (and any other fish species whose movements are inhibited by the cold water temperatures of the White River) may continue to decline without remedial efforts.

Introduction

The National Parks Omnibus Management Act (1998) facilitated a monitoring program that allows 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. 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.

One of the 15 parks being inventoried is Buffalo National River. An overview of the park is available in Mott and Luraas (2004) and is summarized here. The park is managed by the NPS, is considered one of the region's finest natural rivers, and is one of the few entirely free flowing rivers in the country. The Buffalo River is considered an Extraordinary Resource Water by the State of Arkansas (Arkansas Pollution Control and Ecology Commission, 2004). The park includes 135 miles of the 151-mile long Buffalo River. Most of the land (61 percent) within the Buffalo River Basin is privately owned; 11 percent of the land is owned by the NPS and 28 percent is owned by the U.S. Department of Agriculture Forest Service and the Arkansas Game and Fish Commission.

As part of the NPS inventory needs, the U.S. Geological Survey, in cooperation with NPS, inventoried fishes in the river during 2001-2003. Data collection in 2003 and report preparation were conducted in cooperation with the NPS Heartland Network as part of the NPS Inventory and Monitoring Program. Data collected in 2001 and 2002 were collected in cooperation with the NPS as part of the NPS National Resources Preservation Program.

The purpose of this report is to describe the results of an inventory of fish collected from sites within Buffalo National River during 2001-2003 (fig. 1, table 1). Detailed results of the

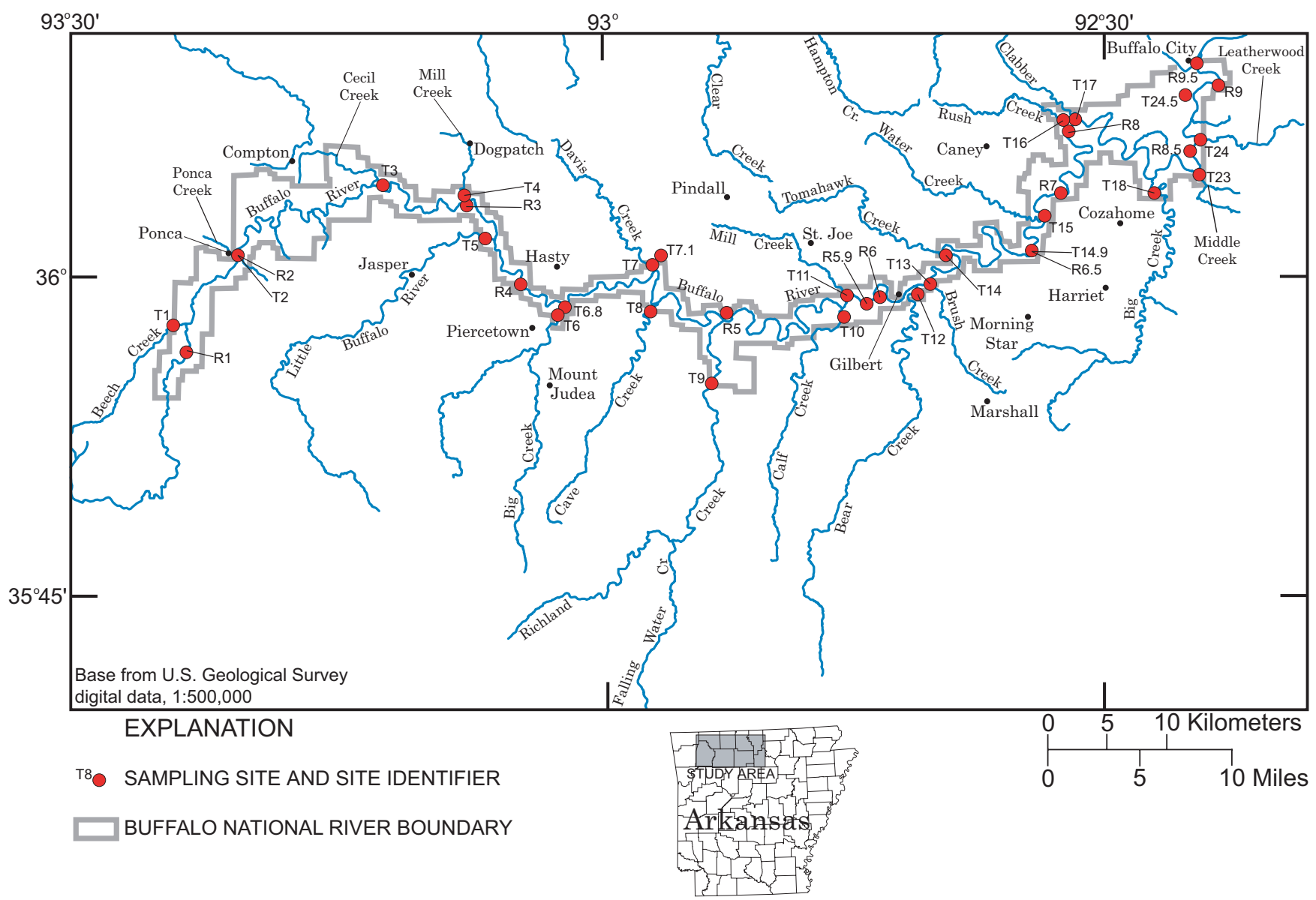


Figure 1. Location of sampling sites, Buffalo National River, Arkansas.

Purpose and Scope

The purpose of this report is to describe the results of an inventory of fish collected from sites within Buffalo National River during 2001-2003 (fig. 1, table 1). Detailed results of the sampling conducted in 2001 and 2002 are reported in Petersen (2004a). Methods used to conduct the inventory are described and a listing of collected species, relative abundance data, and qualitative abundance information are tabulated. During the summers (June through September) of 2001 and 2002, fish communities were sampled at 9 locations on the mainstem of the Buffalo River and at 20 locations on tributaries of the Buffalo River within the boundaries of Buffalo National River. These samples were supplemented in 2003 with 10 samples from the Buffalo River and 5 samples from tributaries of the Buffalo River within the boundaries of Buffalo National River. Many of the samples collected in 2003 were collected from habitats that were not sampled extensively in 2001 and 2002 or during seasons that were not sampled in 2001 and 2002. For example, a backwater area connected to the main channel of the Buffalo River upstream from Leatherwood Creek was sampled in May 2003 and the lowermost half mile of the Buffalo River was sampled during March 2003.

Acknowledgments

The assistance of the NPS and Arkansas Game and Fish Commission (AGFC) and others is gratefully acknowledged. Faron Usrey of Buffalo National River assisted with site selection, site access, and sampling of some sites in 2003. Mark Oliver, Ken Shirley, and Kent Coffey of the AGFC provided an electrofishing boat and assisted with sampling near the mouth of the Buffalo River in March 2003. Similar assistance was provided by both agencies and several individuals in 2001 and 2002. The field identification of two least brook lampreys (*Lampetra aepyptera*) was verified by Henry Robison (Southern Arkansas University) and Thomas Buchanan (University of Arkansas at Fort Smith) from preserved specimens.

Description of Study Area

Buffalo National River is located in the Ozark Plateaus (Fenneman, 1938) of north-central Arkansas (fig. 1). The boundaries of Buffalo National River include about 147 square miles (National Park Service, 2004).

Buffalo National River includes the lower 135 miles of the Buffalo River and the lower sections of tributaries of the Buffalo River. The drainage area of the Buffalo River at its mouth is approximately 1,340 square miles (Sullavan, 1974). The Buffalo River is a tributary of the White River, which is a tailwater trout fishery.

The aquatic habitats of Buffalo National River include a range of stream width, water depth, substrate, flow permanence, water quality, water temperature, and water velocity. Habitats range from small, spring-fed streams to the deep, wide channel

at the mouth of the Buffalo River. Aquatic habitats of several locations in Buffalo National River have been described in greater detail in Panfil and Jacobson (2001), Jacobson and others (2004), and Petersen (2004a, 2004b).

Methods

During July through September 2001 and 2002, extensive fish community sampling was conducted at 29 sites within the boundaries of Buffalo National River (Petersen, 2004a). Samples were collected using pulsed direct-current backpack, tote barge, and boat electrofishing equipment. Kick seining also was used at all sites. Species richness (the number of species collected in a specific sample) and relative abundance (percentage of the total individuals belonging to a species) values were calculated for sites sampled in 2001-2002 (Petersen, 2004a).

To supplement these results (which were from samples collected from typical stream reaches during summer months), samples were collected from less typical habitats (springs, backwaters, and mouth of the Buffalo River) and during other seasons of the year in 2003. Ten additional samples were collected from the Buffalo River and from five samples were collected from tributaries of the Buffalo River in 2003. Locations of some of the 42 sites sampled in 2001-2002 and in 2003 overlapped. For example, in 2003 a sample was collected from near the mouth of the Buffalo River upstream from a shoal locally referred to as "Razor Shoal." The upstream part of this stream reach (site R9.5) is part of the area sampled for site R9 in 2001 and 2002, and one site R9.5 was sampled twice in 2003. Because the objective of this supplemental sampling was to collect fish species not collected or infrequently collected in the 2001-2002 sampling effort, only selected species were collected at several of the sites sampled in the 2003 sampling effort. Professional judgment was used to assign qualitative abundance categories to these species. Samples in 2003 were collected using direct-current backpack or boat electrofishing equipment.

Prior to fish sampling in the streams in 2003, a sampling (stream) 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. Because the measurements were made with PPS, no correction to the position was necessary.

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 (Robison and Buchanan, 1988; Nelson and others, 2004) and counted. Photographs were taken of each species collected, and specimens were released outside of the area being sampled. Fish that were not readily identifiable in the field were preserved for laboratory identification. This process was repeated until the entire stream reach was sampled. Site-specific location and collecting information for all sampling efforts is provided in table 1.

4 The Fishes of Buffalo National River, Arkansas, 2001-2003

Table 1. List of sites and locations for Buffalo National River, Arkansas.

[NA, not available; UTM, Universe Transverse Mercator using North American Datum of 1983, zone 15; location is downstream boundary]

Site name	Site identifier	UTM Easting	UTM Northing
(Sites sampled in 2001-2002)			
Buffalo River near Boxley	R1	463420	3977234
Buffalo River near Ponca	R2	468067	3986161
Buffalo River near Pruitt	R3	487706	3990376
Buffalo River near Hasty	R4	492551	3983526
Buffalo River near Woolum	R5	509328	3981385
Buffalo River at Shine Eye near Gilbert	R6	523796	3982741
Buffalo River at Highway 14 near Harriet	R7	539198	3991714
Buffalo River near Rush	R8	540372	3997403
Buffalo River near mouth near Buffalo City	R9	553320	4001286
Beech Creek near mouth near Boxley	T1	462666	3980267
Ponca Creek near mouth near Ponca	T2	467937	3986317
Cecil Creek near mouth near Erbie	T3	480167	3992953
Mill Creek near mouth near Pruitt	T4	487519	3991227
Little Buffalo River near mouth near Pruitt	T5	489830	3987617
Big Creek near mouth near Carver	T6	495798	3980920
Davis Creek near mouth near Mt. Hersey	T7	503914	3985130
Cave Creek near mouth near Mt. Hersey	T8	504200	3981831
Richland Creek near mouth near Eula	T9	509740	3976360
Calf Creek near mouth near Silver Hill	T10	520614	3980806
Mill Creek near mouth near Silver Hill	T11	520902	3982826
Bear Creek near mouth near Gilbert	T12	527001	3983116
Brush Creek near mouth near Gilbert	T13	528323	3983909
Tomahawk Creek near mouth near Tomahawk	T14	529434	3986188
Water Creek near mouth near Evening Star	T15	537726	3989344
Rush Creek near mouth near Rush	T16	540160	3997971
Clabber Creek near mouth near Rush	T17	540744	3998714
Big Creek near mouth near Cozahome	T18	547721	3991774
Middle Creek near mouth near Big Flat	T23	551488	3993348
Leatherwood Creek near mouth near Advance	T24	551717	3996397
(Sites sampled in 2003, sampled area differed slightly from area sampled in 2001-2002)^a			
Buffalo River near Hasty	R4	492685	3984378
Buffalo River downstream from Highway 65 near St. Joe	R5.9	523125	3982424
Buffalo River at Shine Eye near Gilbert ^b	R6	523125	3982424
Buffalo River at Shine Eye near Gilbert ^c	R6	523773	3982507
Buffalo River upstream from Spring Creek	R6.5	536911	3986273
Buffalo River at Highway 14 near Harriet	R7	538009	3991473
Buffalo River near Rush	R8	540597	3997602
Buffalo River backwater upstream from Leatherwood Creek	R8.5	551285	3994628
Buffalo River from Razor Shoal to mouth ^d	R9.5	551359	4002821
Buffalo River from Razor Shoal to mouth ^e	R9.5	551359	4002821
Lime Kiln Creek near Carver	T6.8	496653	3981434

Table 1. List of sites and locations for Buffalo National River, Arkansas.—Continued

[NA, not available; UTM, Universe Transverse Mercator using North American Datum of 1983, zone 15; location is downstream boundary]

Site name	Site identifier	UTM Easting	UTM Northing
Mill Branch downstream from Mitch Hill Spring near Mt. Hersey	T7.1	504420	3985604
Calf Creek near mouth near Silver Hill	T10	NA	NA
Spring Creek near Cozahome	T14.9	537129	3986226
Cow Creek near Buffalo City ^f	T24.5	551155	3998876

^aBecause of proximity to the 2001-2002 sampling locations some locations sampled in 2003 were designated with the same site identifier used for the 2001-2002 sampling location.

^bSampled April 23, 2003.

^cSampled September 17, 2003.

^dSampled March 19, 2003.

^eSampled September 15, 2003.

^fUTM is estimated from map using a geographic information system.

Fish species collected at some sites in 2003 also are classified according to how common they occurred at the site. 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. Relative abundance at some sites was estimated rather than based on counts of individuals.

At the onset of the study, the NPS provided the USGS with a preliminary list (Boetsch and others, 2000) of 125 fish species (based on county records from maps in Robison and Buchanan, 1988) that were expected to occur at Buffalo National River. 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 reasonably be expected to occur at Buffalo National River and was to be used as a guide to determine if 90 percent of those species reasonably expected to occur at the park had been documented. The preliminary list included some fish that probably do not occur at Buffalo National River because the park is outside of the species' range, or the aquatic habitats in the park are not representative of the typical habitat inhabited by the species. After reviewing the literature and environmental settings at Buffalo National River, the list was revised to better reflect species that have been collected and could occur at Buffalo National River.

Fishes of Buffalo National River

During the 3 years of sampling (2001-2003), 66 species of fish were collected or observed from the 42 sampling sites (tables 1-6; tables 2-6 can be found at the end of the report). The supplemental sampling in 2003 (tables 5 and 6) yielded eight species not collected in 2001 and 2002. These species are: freshwater drum (*Aplodinotus grunniens*), black crappie (*Pomoxis nigromaculatus*), least brook lamprey, quillback

(*Carpiodes cyprinus*), walleye (*Sander vitreus*), American eel (*Anguilla rostrata*), spotted sucker (*Minytrema melanops*), and gizzard shad (*Dorosoma cepedianum*). A single brown trout (*Salmo trutta*) was observed in the Buffalo River between Leatherwood Creek and Middle Creek (Faron D. Usrey, National Park Service, oral commun., 2003).

Ten of these species are endemic to the Ozark Plateaus; they are found in no other part of the world (table 4). Most of these endemic species are darters and minnows.

Stonerollers (*Camptostoma* spp.), duskystripe shiners (*Luxilus pilsbryi*), longear sunfish (*Lepomis megalotis*), and rainbow darters (*Etheostoma caeruleum*) were among the more abundant fish species at most sites. Other species (for example, banded sculpin, *Cottus carolinae*; southern redbelly dace, *Phoxinus erythrogaster*; orangethroat darter, *Etheostoma spectabile*; and Ozark minnow, *Notropis nubilus*) were among the more abundant species at other sites.

Several collected species appear to be rare in Buffalo National River. Less than five individuals of American eel, black crappie, brook silverside (*Labidesthes sicculus*), brown trout, channel catfish (*Ictalurus punctatus*), freshwater drum, gilt darter (*Percina evides*), gizzard shad, least brook lamprey, quillback, redear sunfish (*Lepomis microlophus*), redspotted sunfish (*Lepomis miniatus*), shorthead redhorse (*Moxostoma macrolepidotun*), walleye (*Sander vitreus*), and warmouth (*Lepomis gulosus*) were collected during 2001-2003.

The preliminary expected species list incorrectly listed 47 species because of incorrect species range or habitat requirements. Upon revising this list, the inventory yielded 66 of the 78 species (85 percent) (table 7). Twelve additional species not collected in 2001-2003 may occur at Buffalo National River for two primary reasons—because the species had been collected previously at the park, or because the park occurs within the known species range and habitats found at the park are suitable for the species.

Relation of Fishes to Habitats and Distributional Ranges

Several species were abundant at most sites. Stonerollers, dusky stripe shiners, longear sunfish, and rainbow darters were among the more abundant fish species at most sites. Each of these species is common and abundant throughout much of the Ozark Plateaus in creeks and small rivers (Robison and Buchanan, 1988).

Other species often were the most abundant species at sites with smaller basins or cooler water. Banded sculpin, southern redbelly dace, orangethroat darter, and Ozark minnow prefer small- to medium-sized, springfed streams (Robison and Buchanan, 1988). Southern redbelly dace and orangethroat darter have strong preferences for small creeks. Central stonerollers also were among the most abundant species in smaller creeks.

Several collected species appear to be rare in Buffalo National River. Few American eel, black crappie, brook silverside, brown trout, channel catfish, freshwater drum, gilt darter, gizzard shad, least brook lamprey, quillback, redear sunfish, redblot sunfish, shorthead redhorse, walleye, and warmouth were collected during 2001-2003. There are physiological and geographical reasons for the rarity of most of these species in Buffalo National River. Most of these species are somewhat uncommon in Ozark streams, although brook silversides, channel catfish, and gilt darters are more common and widespread than the other species (Robison and Buchanan, 1988). Black crappie, redear sunfish, redblot sunfish, and warmouth are primarily lowland species. American eel, freshwater drum, gizzard shad, quillback, shorthead redhorse, and walleye generally are more common in the larger rivers (such as the White River) or reservoirs of the Ozark Plateaus. Movement of brown trout into the Buffalo River from the White River is limited by water temperature in the lower part of the Buffalo River. The least brook lamprey previously was known to occur in only one stream west of the White River (a distance of about 50 miles). Brook silversides can be common in backwater areas of Ozark streams (Pflieger, 1997), but were not collected when this habitat was specifically targeted. Channel catfish populations in the Buffalo River have declined since the construction of upstream reservoirs on the White River which release cold water, presumably inhibiting the migratory patterns of warm-water fish in the Buffalo River (Siegwarth, 1992). Gilt darters have been collected (historically) from several sites on the Buffalo River and Buffalo River populations were considered to be stable (Robison and Buchanan, 1988), but only four individuals were collected from three sites in 2001-2003.

Several species on the original list provided by the National Park Service of species suspected to occur within the boundaries of Buffalo National River were not collected during 2001-2003 and most of these species are unlikely to be found within Buffalo National River (for reasons described in Robison and Buchanan, 1988). Forty-one species on the original list have not been reported from the White River Basin (2 species),

this part of the White River Basin (37 species), or the Ozark Plateaus (2 species) (table 7). Other species are restricted to caves (southern cavefish, *Typhlichthys subterraneus*), are an introduced species and have not been collected recently in Arkansas (redbreast sunfish, *Lepomis auritus*), are primarily restricted to reservoirs (threadfin shad, *Dorosoma petenense*), are an introduced species with low survival rate (goldfish, *Carassius auratus*), typically occur in large rivers (blue catfish, *Ictalurus furcatus*), or are restricted to deep, cold lakes (lake trout, *Salvelinus namaycush*).

Comparison to Past Inventories

During the 3 years of sampling, 66 species of fish were collected or observed from the 42 sampling sites (tables 1-6). Nine species collected or observed in 2001-2003 (freshwater drum, least brook lamprey, quillback, walleye, shorthead redhorse, redblot sunfish, white sucker (*Catostomus commersoni*), warmouth, and brown trout) previously had not yet been reported from Buffalo National River (table 4) (Guidroz, 1975; Cashner and Brown, 1977; Robison and Buchanan, 1988); two walleye also were collected by Mark Oliver and Ken Shirley of the Arkansas Game and Fish Commission one week prior to USGS collection of walleye (Mark Oliver and Ken Shirley, Arkansas Game and Fish Commission, oral commun., 2003). These new species increases the number of species reported from Buffalo National River to 74 (table 4). Petersen (2004a) erroneously stated that 73 species have been reported from Buffalo National River, but did not include the river carpsucker (*Carpiodes carpio*) reported by Walters (1993).

Eight species previously collected from Buffalo National River were not collected in 2001-2003. These species are the American brook lamprey (*Lampetra appendix*), black bullhead (*Ameiurus melas*), blackside darter (*Percina maculata*), highfin carpsucker (*Carpiodes velifer*), river carpsucker, speckled darter (*Etheostoma stigmaeum*), spotted bass (*Micropterus punctulatus*), and white bass (*Morone chrysops*) (Guidroz, 1975; Cashner and Brown, 1977; Robison and Buchanan, 1988; and Walters, 1993). Distributional records and the limited amount of published abundance data suggest that some of these species (black bullhead, blackside darter, highfin carpsucker, river carpsucker, speckled darter, and white bass) rarely occur at Buffalo National River. These species may continue to occur in low numbers (or may be more common seasonally or in less common habitats) within Buffalo National River. Historical distribution records (Cashner and Brown, 1977; Robison and Buchanan, 1988) for American brook lamprey and spotted bass show that these species have previously been collected from several sites on the Buffalo River and suggest that these species were once more common than at present (2001-2003).

The golden shiner (*Notemigonus crysoleucas*) was listed in two publications dealing with surveys of the Buffalo River and tributaries (Guidroz, 1975; Cashner and Brown, 1977), but neither collection location can be verified as being within the boundaries of Buffalo National River. Guidroz (1975) collected

golden shiners from a location that is upstream (probably less than 800 meters) from the park boundary. Cashner and Brown (1977) mention that Neil Douglas (University of Louisiana at Monroe) had found a population of golden shiners in Big Creek (in the upper section of the Buffalo River); the exact location was not given and therefore could not be determined to have been within the boundaries of the park.

Species of Interest

Although no fish species collected from Buffalo National River are federally-listed threatened or endangered species (U.S. Fish and Wildlife Service, 2004), several species collected at Buffalo National River may be of special interest to NPS managers and others. Ten species are endemic to the Ozark Plateaus area and most of these ten are restricted to the White River Basin. Most of these endemic species are rather common across the Ozark Plateaus where suitable habitat exists. For some species the Buffalo River is a population stronghold. The yoke darter and Ozark bass are especially abundant in the Buffalo River. In Arkansas, the Ozark shiner (*Notropis ozarcanus*) is most abundant in the Buffalo River (Robison and Buchanan, 1988). Robison (1997) stated that although populations of Ozark shiners are declining in Arkansas, this is not typically the case in the Buffalo River. Data from 2001-2003 indicate that gilt darters are less common in the Buffalo River than during the 1970's. Only 4 individuals were collected from three sites in 2001-2003; Guidroz (1975) collected 48 individuals from three sites, and Cashner and Brown (1977) reported that the gilt darter was present at most sites in the lower 65 miles of the Buffalo River. Populations of channel catfish (and any other fish species whose movements are inhibited by the cold water temperatures of the White River caused by hypolimnetic releases from an upstream reservoir) may continue to decline without remedial efforts.

Summary

During 2001 and 2002, extensive fish community sampling was conducted at 29 sites within the boundaries of Buffalo National River. Samples were collected using backpack, tote barge, and boat electrofishing equipment. Kick seining also was used at all sites. To supplement these results, samples were collected in 2003 from less typical habitats (springs, backwaters, and mouth of the Buffalo River) and during other seasons of the year. Ten supplemental samples were collected from the Buffalo River and five samples were collected from tributaries of the Buffalo River. Locations of some of the 42 sites sampled in 2001-2002 and in 2003 overlapped.

During the 3 years of sampling, 66 species of fish were collected or observed from the 42 sampling sites. The supplemental sampling in 2003 yielded eight species not collected in 2001 and 2002.

Stonerollers, dusky stripe shiners, longear sunfish, and rainbow darters were among the more abundant fish species at most sites. Each of these species is common and abundant throughout much of the Ozark Plateaus in creeks and small rivers. Other species (for example, banded sculpin, southern redbelly dace, orangethroat darter, and Ozark minnow) were among the more abundant species at other sites. These species prefer small- to medium-sized, springfed streams or small creeks.

A preliminary list of species expected to occur at Buffalo National River (125 species) provided by the National Park Service incorrectly listed 47 species because of incorrect species range or habitat requirements. Upon revising this list, the inventory yielded 66 of the 78 species (85 percent). Twelve additional species not collected in 2001-2003 may occur at Buffalo National River for two primary reasons--because the species had been collected previously at the park, or because the park occurs within the known species range and habitats found at the park are suitable for the species.

Although no fish species collected from Buffalo National River are federally-listed threatened or endangered species, several species collected at Buffalo National River may be of special interest to NPS managers and others. Ten species are endemic to the Ozark Plateaus area and most of these ten are restricted to the White River Basin. Most of these endemic species are rather common across the Ozark Plateaus where suitable habitat exists. For some species the Buffalo River is a population stronghold. The yoke darter and Ozark bass are especially abundant in the Buffalo River. In Arkansas, the Ozark shiner is most abundant in the Buffalo River and, although populations of Ozark shiners are declining in Arkansas, this is not typically the case in the Buffalo River. Data from 2001-2003 indicate that gilt darters are less common in the Buffalo River than during the 1970's. Only four individuals were collected from three sites in 2001-2003, but several individuals previously have been collected from several sites in the lower 65 miles of the Buffalo River. Populations of channel catfish (and any other fish species whose movements are inhibited by the cold water temperatures of the White River) may continue to decline without remedial efforts.

References

- Arkansas Pollution Control and Ecology Commission, 2004, Regulation No. 2, regulation establishing water quality standards for surface waters of the State of Arkansas, variously paginated: Accessed June 6, 2005 at http://www.adeq.state.ar.us/regs/files/reg02_final_040517.pdf.
- Boetsch, John, DeBacker, Michael, Hughes, Phillip, Peitz, David, Thomas, Lisa, Wagner, Gia, and Witcher, Brian, 2000, A study plan to inventory vascular plants and vertebrates: Heartland Network, National Park Service.
- Cashner, R.C. and Brown J.D., 1977, Longitudinal distribution of the fishes of the Buffalo River in northwestern Arkansas, with some taxonomic considerations: *Tulane Studies in Zoology and Botany* v. 19:37-45.
- Fenneman, N.M., 1938, *Physiography of eastern United States*: New York, McGraw-Hill, 689 p.
- Guidroz, T.P., 1975, *Fishes of the Buffalo River, White River system, Arkansas*: M.S. thesis, Northeast Louisiana University, Monroe, Louisiana, 33 p.
- Jacobson, R.B., Johnson, H.E., Reuter, J.M., and Wright, M.P., 2004, Physical aquatic habitat data, Ozark Plateaus, Missouri and Arkansas: U.S. Geological Survey Data Series DS-94, available on the web at: <http://www.cerc.usgs.gov/pubs/ozarks/DSR-2004-0094.htm>
- Mott, D.N., and Luraas, Jessica, 2004, Water resources management plan, Buffalo National River, Arkansas: National Park Service, 144 p.
- National Park Service, 2004, Buffalo National River, facts: Accessed March 15, 2004 at <http://www.nps.gov/buff/pphtml/facts.html>.
- Nelson, J.S., Crossman, E.J., Espinoza-Perez, Hector, Findley, L.T., Gilbert, C.R., Lea, R.N., and Williams, J.D., 2004, Common and scientific names of fishes from the United States, Canada, and Mexico: Bethesda, Maryland, American Fisheries Society, Special Publication 29, 386 p.
- Panfil, M.S. and Jacobson, R.B., 2001, Relations among geology, physiography, land use, and stream habitat conditions in the Buffalo and Current River systems, Missouri and Arkansas: U.S. Geological Survey Biological Science Report 2001-0005, 111 p.
- Petersen, J.C. 2004a, Fish communities of the Buffalo River Basin and nearby basins of Arkansas and their relation to selected environmental factors, 2001-2002: U.S. Geological Survey Scientific Investigations Report 2004-5119, 93 p.
- Petersen, J.C., 2004b, Stream habitat and water-quality information for sites in the Buffalo River Basin and nearby basins of Arkansas, 2001-2002: U.S. Geological Survey Open-File Report 2004-1277, 11 p.
- Pflieger, W.L., 1997, *The fishes of Missouri* (revised edition): Jefferson City, Missouri, Missouri Department of Conservation, 372 p.
- Robison, H.W., 1997, Distribution and status of the Ozark shiner, *Notropis ozarcanus* Meek, in Arkansas: *Journal of the Arkansas Academy of Science*, v. 51, p. 150-158.
- Robison, H.W. and Buchanan, T.M., 1988, *Fishes of Arkansas*: Fayetteville, Arkansas, University of Arkansas Press, 536 p.
- Siegwarth, G. L., 1992, Channel catfish of the Buffalo River, Arkansas: population abundance, reproductive output, and assessment of stocking catchable size fish: M.S. thesis, Fayetteville, Arkansas, University of Arkansas 107 p.
- Sullivan, J.N., 1974, Drainage areas of streams in Arkansas, White River Basin: U.S. Geological Survey Open-File Report, 123 p.
- U.S. Fish and Wildlife Service, 2004, Threatened and endangered animals and plants: Accessed March 24, 2004 at <http://endangered.fws.gov/wildlife.html>.
- Walters, J.P., 1993, Intraspecific habitat segregation of small-mouth bass in the Buffalo River, Arkansas: Arkansas Cooperative Fish and Wildlife Research Unit Publication No. 11, 65 p.

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; --, not collected; <, less than]

Site name	Site identifier	Date	Species richness	AMM	ASD	BDD	BDS	BEC	BES	BLG	BNM
Buffalo River near Boxley	R1	07/31/01	26	0.08	0.1	--	6.56	0.31	1.56	--	0.4
Buffalo River near Boxley	R1	08/07/02	24	--	--	--	1.29	1.57	0.72	--	1
Buffalo River near Ponca	R2	07/30/01	30	--	0.8	1.61	0.85	0.47	0.66	--	0.4
Buffalo River near Ponca	R2	07/23/02	28	--	0.8	0.44	<0.01	0.11	0.22	--	0.1
Buffalo River near Pruitt	R3	08/03/01	33	--	1.3	0.93	--	1.07	2.42	0.1	0.5
Buffalo River near Pruitt	R3	06/27/02	32	0.08	2.8	0.42	1.66	3.32	3.74	--	4.2
Buffalo River near Hasty	R4	07/31/01	35	0.05	2.4	0.99	--	13.2	10.2	0.2	1.7
Buffalo River near Hasty	R4	07/15/02	33	--	1.6	0.46	0.37	1.47	9.36	0.5	3
Buffalo River near Woolum	R5	07/18/01	30	0.08	1.2	2.22	--	2.14	3.82	--	1.5
Buffalo River near Woolum	R5	07/16/02	35	--	0.1	0.97	--	3.41	13.1	0.1	7
Buffalo River at Shine Eye near Gilbert	R6	07/18/01	34	0.05	1.9	4.18	0.05	3.64	2.17	--	2.1
Buffalo River at Shine Eye near Gilbert	R6	07/17/02	31	--	0.3	1.38	--	5.76	3.26	--	2.4
Buffalo River at Highway 14 near Harriet	R7	07/20/01	34	--	1.7	4.02	--	1.5	1.66	--	2.4
Buffalo River at Highway 14 near Harriet	R7	09/13/02	35	0.05	4.1	1.55	--	0.78	1.19	--	1.4
Buffalo River near Rush	R8	07/26/01	31	--	1	1.27	--	1.79	2.49	--	2
Buffalo River near Rush	R8	07/18/02	34	--	0.8	<0.01	--	2.67	4.27	--	1.6
Buffalo River near mouth near Buffalo City	R9	07/24/01	34	--	1.2	6.53	--	0.4	2.53	0.8	0.7
Buffalo River near mouth near Buffalo City	R9	07/12/02	37	--	1.5	2.82	--	1.16	2.82	0.5	0.3
Beech Creek near mouth near Boxley	T1	06/19/01	18	--	--	--	2.76	--	0.98	--	--
Beech Creek near mouth near Boxley	T1	06/20/02	14	--	--	--	1.26	--	--	--	--
Ponca Creek near mouth near Ponca	T2	07/31/01	18	--	--	0.15	1.79	--	--	0.2	--
Ponca Creek near mouth near Ponca	T2	06/25/02	15	--	--	--	1.91	--	0.24	--	0.2
Cecil Creek near mouth near Erbie	T3	06/20/01	24	--	--	--	1.61	0.36	2.33	--	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; --, not collected; <, less than]

Site name	Site identifier	Date	Species richness	AMM	ASD	BDD	BDS	BEC	BES	BLG	BNM
Cecil Creek near mouth near Erbie	T3	06/24/02	27	0	0	0.16	5.13	1.44	0.64	0.2	0.6
Mill Creek near mouth near Pruitt	T4	08/01/01	22	0	0	<0.01	3.79	3.23	0	0.4	13
Mill Creek near mouth near Pruitt	T4	06/21/02	19	0	0	0	11.5	1.5	0.5	0	9
Little Buffalo River near mouth near Pruitt	T5	08/02/01	31	0.06	0.9	1.65	0	3.65	0.65	0	2.9
Little Buffalo River near mouth near Pruitt	T5	08/19/02	32	0	0.8	1.18	0	0.59	0.85	0	6.4
Big Creek near mouth near Carver	T6	08/07/01	30	0	0.2	0.15	0.05	0.96	0.96	0	2
Big Creek near mouth near Carver	T6	07/24/02	30	0	0.6	0.63	3.67	0	0.94	0	5.2
Davis Creek near mouth near Mt. Hersey	T7	08/03/01	18	0	0	0	11.6	0	0	0	0
Davis Creek near mouth near Mt. Hersey	T7	07/22/02	20	0	0	0.23	13.8	0	0	0	0.7
Cave Creek near mouth near Mt. Hersey	T8	08/08/01	25	0	3.3	1.78	0	2.47	0.69	0	1.1
Cave Creek near mouth near Mt. Hersey	T8	07/26/02	30	0	3	1.72	1	1.14	1.43	0.4	5
Richland Creek near mouth near Eula	T9	07/13/01	26	0	0	8.79	11.5	0	1.41	0.2	0.2
Calf Creek near mouth near Silver Hill	T10	06/21/01	22	0	0.1	0	4.53	0	0.21	0	0
Calf Creek near mouth near Silver Hill	T10	07/22/02	24	0	0	0	9.88	0	0.23	0	0.2
Mill Creek near mouth near Silver Hill	T11	06/22/01	20	0	0	0	14.4	0	0.22	0	0
Mill Creek near mouth near Silver Hill	T11	06/29/02	20	0	0	0.25	11.2	0	1	0	0
Bear Creek near mouth near Gilbert	T12	07/12/01	27	0	3.5	1.84	0.52	0.79	2.89	0	0
Bear Creek near mouth near Gilbert	T12	08/08/02	37	0	1.1	0.66	0.04	1.08	2.36	0	1.2
Brush Creek near mouth near Gilbert	T13	07/16/01	15	0	0	0	1.78	0	0	0	0
Brush Creek near mouth near Gilbert	T13	06/28/02	16	0	0	0.14	4.29	0	0	0	0.4
Tomahawk Creek near mouth near Tomahawk	T14	08/10/01	30	0	1.1	1.28	5.04	0.2	0.1	0	0.3
Tomahawk Creek near mouth near Tomahawk	T14	07/19/02	31	0	1	0	3.23	0.08	0.47	0	0.1
Water Creek near mouth near Evening Star	T15	08/21/01	31	0	1.6	0.88	0.13	0.19	0.81	0	0.1
Water Creek near mouth near Evening Star	T15	07/08/02	31	--	3.2	1.28	1.6	0.96	1.6	--	1.6

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; --, not collected; <, less than]

Site name	Site identifier	Date	Species richness	AMM	ASD	BDD	BDS	BEC	BES	BLG	BNM
Rush Creek near mouth near Rush	T16	07/25/01	17	--	--	--	14.8	--	--	--	--
Rush Creek near mouth near Rush	T16	08/23/02	12	--	--	--	4.36	--	--	--	0.3
Clabber Creek near mouth near Rush	T17	07/27/01	27	--	0.7	0.29	0.1	0.1	--	--	0.1
Clabber Creek near mouth near Rush	T17	08/23/02	25	--	2.2	0.68	--	0.81	--	--	0.5
Big Creek near mouth near Cozahome	T18	07/10/01	26	--	0.5	1.15	0.12	--	--	--	0.4
Big Creek near mouth near Cozahome	T18	07/10/02	27	--	0.5	2.01	1.34	--	--	--	2.7
Middle Creek near mouth near Big Flat	T23	07/11/01	19	--	--	0.58	1.17	--	--	--	7
Middle Creek near mouth near Big Flat	T23	07/11/02	22	--	0.6	--	4.55	--	0.57	--	--
Leatherwood Creek near mouth near Advance	T24	07/11/01	19	--	0.9	--	--	--	--	--	3.8
Leatherwood Creek near mouth near Advance	T24	07/11/02	20	--	--	0.53	--	--	--	--	2.1

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	BRH	BRS	BTM	CKM	CMC	CMS	CNL	CRC	DSS	FHC
Buffalo River near Boxley	R1	07/31/01	0.16	<0.01	--	--	--	--	--	--	12.42	--
Buffalo River near Boxley	R1	08/07/02	--	--	--	--	--	--	--	0.29	8.58	--
Buffalo River near Ponca	R2	07/30/01	0.19	--	--	--	--	--	--	--	23.8	--
Buffalo River near Ponca	R2	07/23/02	0.22	--	--	--	--	--	--	--	12.08	--
Buffalo River near Pruitt	R3	08/03/01	0.09	0.05	0.19	--	--	2.19	--	--	21.45	--
Buffalo River near Pruitt	R3	06/27/02	0.33	--	0.08	--	--	1.08	--	--	15.86	--
Buffalo River near Hasty	R4	07/31/01	0.47	0.05	0.62	--	--	0.24	--	--	16.33	--
Buffalo River near Hasty	R4	07/15/02	3.39	--	0.73	--	--	1.01	--	--	7.16	--
Buffalo River near Woolum	R5	07/18/01	0.46	--	--	0.08	--	0.15	--	--	11.92	--
Buffalo River near Woolum	R5	07/16/02	4.8	--	--	--	--	1.18	0.07	0.07	4.94	0.21
Buffalo River at Shine Eye near Gilbert	R6	07/18/01	1.2	--	0.16	0.11	--	0.92	--	--	22.83	0.16
Buffalo River at Shine Eye near Gilbert	R6	07/17/02	5.76	--	--	0.25	--	2.51	--	--	20.8	0.63
Buffalo River at Highway 14 near Harriet	R7	07/20/01	0.71	--	0.08	--	--	0.87	--	--	13.88	0.24
Buffalo River at Highway 14 near Harriet	R7	09/13/02	1.61	--	0.16	0.47	--	0.62	--	--	23.41	0.26
Buffalo River near Rush	R8	07/26/01	0.17	--	0.35	--	--	0.92	--	--	19.19	0.23
Buffalo River near Rush	R8	07/18/02	2.44	--	0.15	0.15	--	2.29	--	--	29.98	0.08
Buffalo River near mouth near Buffalo City	R9	07/24/01	0.53	--	0.67	--	0.13	0.13	--	--	9.47	0.53
Buffalo River near mouth near Buffalo City	R9	07/12/02	6.64	--	--	0.33	0.17	0.66	--	--	17.11	0.5
Beech Creek near mouth near Boxley	T1	06/19/01	--	--	--	--	--	0.1	--	--	19.39	--
Beech Creek near mouth near Boxley	T1	06/20/02	--	--	--	--	--	--	--	--	14.73	--
Ponca Creek near mouth near Ponca	T2	07/31/01	--	--	0.6	--	--	--	--	0.6	8.04	--
Ponca Creek near mouth near Ponca	T2	06/25/02	--	--	0.24	--	--	--	--	--	14.8	--
Cecil Creek near mouth near Erbie	T3	06/20/01	--	--	0.36	--	--	2.51	--	--	10.04	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	BRH	BRS	BTM	CKM	CMC	CMS	CNL	CRC	DSS	FHC
Cecil Creek near mouth near Erbie	T3	06/24/02	--	--	<0.01	--	--	0.96	--	--	28.37	--
Mill Creek near mouth near Pruitt	T4	08/01/01	--	--	1.26	--	--	1.69	--	--	21.49	--
Mill Creek near mouth near Pruitt	T4	06/21/02	--	--	0.5	--	--	--	--	--	16	--
Little Buffalo River near mouth near Pruitt	T5	08/02/01	0.12	--	0.41	--	--	0.71	--	--	10.88	--
Little Buffalo River near mouth near Pruitt	T5	08/19/02	0.85	--	0.17	--	--	0.68	--	--	8.97	--
Big Creek near mouth near Carver	T6	08/07/01	0.1	--	0.86	--	--	0.46	--	--	10.64	--
Big Creek near mouth near Carver	T6	07/24/02	--	--	0.52	--	--	0.1	--	0.21	10.69	--
Davis Creek near mouth near Mt. Hersey	T7	08/03/01	--	--	--	--	--	1.03	--	--	39.32	--
Davis Creek near mouth near Mt. Hersey	T7	07/22/02	--	--	0.12	--	--	--	--	--	26.01	--
Cave Creek near mouth near Mt. Hersey	T8	08/08/01	--	--	0.14	--	--	0.69	--	--	16.19	--
Cave Creek near mouth near Mt. Hersey	T8	07/26/02	2.29	--	0.43	--	--	0.29	--	--	12.3	--
Richland Creek near mouth near Eula	T9	07/13/01	--	--	--	--	--	4.71	--	0.31	7.69	--
Calf Creek near mouth near Silver Hill	T10	06/21/01	--	--	0.07	--	--	--	--	--	8.27	--
Calf Creek near mouth near Silver Hill	T10	07/22/02	0.69	--	0.08	--	--	0.08	--	--	14.21	--
Mill Creek near mouth near Silver Hill	T11	06/22/01	--	--	0.11	--	--	1.43	--	0.33	32.35	--
Mill Creek near mouth near Silver Hill	T11	06/29/02	--	--	0.25	--	--	1.24	--	--	13.18	--
Bear Creek near mouth near Gilbert	T12	07/12/01	0.39	--	0.26	--	--	0.13	--	--	9.97	--
Bear Creek near mouth near Gilbert	T12	08/08/02	0.04	--	0.29	0.12	--	0.21	--	--	13.49	--
Brush Creek near mouth near Gilbert	T13	07/16/01	--	--	--	--	--	--	--	1.54	13.88	--
Brush Creek near mouth near Gilbert	T13	06/28/02	--	--	--	--	--	--	--	--	8	--
Tomahawk Creek near mouth near Tomahawk	T14	08/10/01	0.89	--	1.58	0.1	--	0.69	--	--	11.26	--
Tomahawk Creek near mouth near Tomahawk	T14	07/19/02	0.16	--	0.47	0.47	--	0.55	--	--	17.94	--
Water Creek near mouth near Evening Star	T15	08/21/01	0.13	--	0.19	0.06	--	0.44	--	--	17.75	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	BRH	BRS	BTM	CKM	CMC	CMS	CNL	CRC	DSS	FHC
Water Creek near mouth near Evening Star	T15	07/08/02	3.53	--	0.96	0.96	--	0.96	--	--	9.94	--
Rush Creek near mouth near Rush	T16	07/25/01	0.52	--	0.7	--	--	--	--	--	21.08	--
Rush Creek near mouth near Rush	T16	08/23/02	--	--	--	--	--	--	--	--	7.56	--
Clabber Creek near mouth near Rush	T17	07/27/01	0.1	--	0.96	--	--	0.29	--	0.1	20.46	--
Clabber Creek near mouth near Rush	T17	08/23/02	0.27	--	0.54	--	--	0.27	--	--	26.19	--
Big Creek near mouth near Cozahome	T18	07/10/01	--	--	0.12	--	--	0.35	--	--	21.43	--
Big Creek near mouth near Cozahome	T18	07/10/02	0.89	--	--	0.22	--	0.67	--	--	13.17	--
Middle Creek near mouth near Big Flat	T23	07/11/01	--	--	3.51	--	--	--	--	--	30.41	--
Middle Creek near mouth near Big Flat	T23	07/11/02	5.68	--	0.57	--	--	--	--	0.57	16.48	--
Leatherwood Creek near mouth near Advance	T24	07/11/01	--	--	1.89	--	--	--	--	--	19.81	--
Leatherwood Creek near mouth near Advance	T24	07/11/02	3.68	--	1.58	--	--	--	--	--	26.32	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	GRH	GSD	GSF	GTD	HHC	LES	LGP	LMB	LNG	NHS
Buffalo River near Boxley	R1	07/31/01	--	1.88	1.09	--	1.25	8.44	--	--	--	0.23
Buffalo River near Boxley	R1	08/07/02	0.14	4.15	1.29	--	0.43	7.87	--	--	--	1.72
Buffalo River near Ponca	R2	07/30/01	--	2.83	0.85	--	1.32	8.5	--	--	--	0.94
Buffalo River near Ponca	R2	07/23/02	--	4.1	1.88	--	0.89	26.39	--	--	--	0.67
Buffalo River near Pruitt	R3	08/03/01	--	1.07	0.74	--	1.35	12.33	--	--	0.05	0.28
Buffalo River near Pruitt	R3	06/27/02	--	1.91	0.75	--	0.5	9.14	--	0.08	0.08	0.5
Buffalo River near Hasty	R4	07/31/01	--	1.51	1.61	0.05	0.57	12.21	0.05	0.09	0.05	0.33
Buffalo River near Hasty	R4	07/15/02	1.19	1.56	1.19	--	--	30.09	0.73	0.28	0.28	1.19
Buffalo River near Woolum	R5	07/18/01	0.15	3.9	0.99	--	0.31	15.43	0.31	--	--	3.59
Buffalo River near Woolum	R5	07/16/02	1.18	3.76	1.25	--	0.35	24.55	0.63	0.35	--	0.9
Buffalo River at Shine Eye near Gilbert	R6	07/18/01	--	5.33	0.11	--	0.22	7.77	--	--	--	1.63
Buffalo River at Shine Eye near Gilbert	R6	07/17/02	5.39	1.13	--	--	--	11.9	--	--	--	2.51
Buffalo River at Highway 14 near Harriet	R7	07/20/01	0.08	5.99	0.39	--	0.63	20.82	--	--	--	5.21
Buffalo River at Highway 14 near Harriet	R7	09/13/02	--	4.45	0.31	0.05	1.09	11.03	0.05	--	--	1.4
Buffalo River near Rush	R8	07/26/01	0.06	0.81	0.69	--	0.12	18.73	--	0.12	0.17	1.79
Buffalo River near Rush	R8	07/18/02	0.15	1.07	0.92	<0.01	0.15	13.27	0.46	--	--	1.22
Buffalo River near mouth near Buffalo City	R9	07/24/01	0.4	6.8	0.13	--	1.07	10.27	0.13	0.27	--	0.4
Buffalo River near mouth near Buffalo City	R9	07/12/02	0.17	4.32	0.17	--	0.83	18.27	0.17	0.33	--	1.66
Beech Creek near mouth near Boxley	T1	06/19/01	--	0.69	0.39	--	0.49	6.1	--	--	--	--
Beech Creek near mouth near Boxley	T1	06/20/02	--	2.24	--	--	1.4	9.68	--	--	--	--
Ponca Creek near mouth near Ponca	T2	07/31/01	--	--	9.97	--	0.45	--	--	0.15	--	--
Ponca Creek near mouth near Ponca	T2	06/25/02	--	0.24	19.57	--	1.91	--	--	--	--	--
Cecil Creek near mouth near Erbie	T3	06/20/01	--	0.54	0.72	--	1.97	10.57	--	--	--	1.43

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	GRH	GSD	GSF	GTD	HHC	LES	LGP	LMB	LNG	NHS
Cecil Creek near mouth near Erbie	T3	06/24/02	--	2.56	0.48	--	1.92	2.56	--	--	--	0.16
Mill Creek near mouth near Pruitt	T4	08/01/01	--	2.67	0.14	--	2.67	16.71	--	--	--	1.26
Mill Creek near mouth near Pruitt	T4	06/21/02	--	1.5	--	--	0.5	6	--	--	--	0.5
Little Buffalo River near mouth near Pruitt	T5	08/02/01	--	1.65	1.18	--	0.59	12.24	--	0.06	--	0.12
Little Buffalo River near mouth near Pruitt	T5	08/19/02	0.08	5.41	0.42	--	1.18	14.72	--	--	0.17	2.28
Big Creek near mouth near Carver	T6	08/07/01	0.05	0.71	1.98	--	1.47	19.35	--	--	--	0.15
Big Creek near mouth near Carver	T6	07/24/02	0.1	1.05	3.67	--	0.73	15.09	--	--	0.21	1.05
Davis Creek near mouth near Mt. Hersey	T7	08/03/01	--	0.17	--	--	1.2	2.39	--	--	--	--
Davis Creek near mouth near Mt. Hersey	T7	07/22/02	--	0.92	0.23	--	1.73	2.2	--	--	--	0.23
Cave Creek near mouth near Mt. Hersey	T8	08/08/01	--	1.92	--	--	0.96	12.35	--	--	--	0.82
Cave Creek near mouth near Mt. Hersey	T8	07/26/02	--	3.86	0.29	--	1.29	18.6	--	--	--	1
Richland Creek near mouth near Eula	T9	07/13/01	1.88	1.26	0.63	--	0.31	0.63	--	--	--	6.28
Calf Creek near mouth near Silver Hill	T10	06/21/01	0.21	0.21	--	--	0.14	0.21	--	--	--	0.71
Calf Creek near mouth near Silver Hill	T10	07/22/02	0.15	0.15	--	--	0.62	0.15	--	--	--	1.39
Mill Creek near mouth near Silver Hill	T11	06/22/01	--	0.44	--	--	2.63	1.32	--	0.22	--	0.66
Mill Creek near mouth near Silver Hill	T11	06/29/02	--	0.75	--	--	1.99	1.99	--	--	--	0.5
Bear Creek near mouth near Gilbert	T12	07/12/01	--	3.67	--	--	1.44	16.8	--	--	--	1.71
Bear Creek near mouth near Gilbert	T12	08/08/02	--	2.94	0.54	--	0.74	13.61	--	0.04	0.04	1.99
Brush Creek near mouth near Gilbert	T13	07/16/01	--	--	0.12	--	2.37	1.3	--	--	--	--
Brush Creek near mouth near Gilbert	T13	06/28/02	--	0.86	--	--	1.71	1.14	--	--	--	0.14
Tomahawk Creek near mouth near Tomahawk	T14	08/10/01	--	1.68	0.1	--	4.84	6.42	--	--	--	1.68
Tomahawk Creek near mouth near Tomahawk	T14	07/19/02	--	0.31	0.08	--	1.65	6.77	--	--	--	1.65
Water Creek near mouth near Evening Star	T15	08/21/01	--	1.81	--	--	1.19	4.06	--	--	--	0.19

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	GRH	GSD	GSF	GTD	HHC	LES	LGP	LMB	LNG	NHS
Water Creek near mouth near Evening Star	T15	07/08/02	1.92	2.56	--	--	1.6	12.18	--	--	--	6.73
Rush Creek near mouth near Rush	T16	07/25/01	--	0.17	--	--	2.79	8.01	--	--	--	--
Rush Creek near mouth near Rush	T16	08/23/02	--	0.29	--	--	4.65	6.98	--	--	--	--
Clabber Creek near mouth near Rush	T17	07/27/01	--	2.59	0.29	--	1.63	10.85	--	--	--	1.25
Clabber Creek near mouth near Rush	T17	08/23/02	--	2.85	--	--	2.17	9.91	--	--	--	1.76
Big Creek near mouth near Cozahome	T18	07/10/01	0.12	1.27	0.23	--	0.58	15.09	--	--	--	0.23
Big Creek near mouth near Cozahome	T18	07/10/02	0.45	3.35	0.67	--	0.89	11.16	--	--	--	1.34
Middle Creek near mouth near Big Flat	T23	07/11/01	--	5.85	1.17	--	4.09	17.54	--	--	--	--
Middle Creek near mouth near Big Flat	T23	07/11/02	1.14	1.7	1.7	--	7.95	7.39	--	--	--	6.25
Leatherwood Creek near mouth near Advance	T24	07/11/01	--	0.94	3.77	--	3.77	19.81	--	--	--	0.94
Leatherwood Creek near mouth near Advance	T24	07/11/02	0.53	0.53	4.74	--	6.84	6.32	--	--	--	3.16

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	NSF	OKS	OMT	OTD	OZB	OZC	OZM	OZS	RBD	RBT
Buffalo River near Boxley	R1	07/31/01	--	--	0.08	--	0.47	--	3.75	--	7.19	--
Buffalo River near Boxley	R1	08/07/02	0.57	--	--	0.86	1.72	--	9.44	--	7.3	--
Buffalo River near Ponca	R2	07/30/01	0.38	--	3.12	--	1.42	0.38	1.79	0.47	16	--
Buffalo River near Ponca	R2	07/23/02	0.11	--	0.89	--	3.66	0.89	1.33	--	3.55	--
Buffalo River near Pruitt	R3	08/03/01	0.84	--	0.05	--	0.74	0.14	5.96	2.09	3.12	--
Buffalo River near Pruitt	R3	06/27/02	1	--	0.25	--	0.33	0.42	6.56	1	3.32	--
Buffalo River near Hasty	R4	07/31/01	1.42	--	0.05	--	2.22	0.24	2.93	--	4.5	--
Buffalo River near Hasty	R4	07/15/02	0.92	--	--	--	4.95	0.28	11.7	4.95	1.65	--
Buffalo River near Woolum	R5	07/18/01	0.15	--	--	--	1.83	0.15	4.89	--	5.04	--
Buffalo River near Woolum	R5	07/16/02	1.39	--	<0.01	--	1.67	0.56	2.43	1.11	2.43	--
Buffalo River at Shine Eye near Gilbert	R6	07/18/01	0.33	--	0.22	--	2.39	1.2	3.37	0.38	3.7	--
Buffalo River at Shine Eye near Gilbert	R6	07/17/02	1	--	0.63	--	7.02	0.25	2.13	0.25	1.38	--
Buffalo River at Highway 14 near Harriet	R7	07/20/01	0.32	--	1.03	--	3.31	2.76	0.39	1.34	2.13	--
Buffalo River at Highway 14 near Harriet	R7	09/13/02	0.16	--	1.04	--	2.54	3.78	3.42	0.16	2.43	--
Buffalo River near Rush	R8	07/26/01	--	--	0.06	--	2.43	3.76	5.72	0.17	0.75	--
Buffalo River near Rush	R8	07/18/02	0.76	--	<0.01	--	1.07	2.36	7.17	--	0.46	--
Buffalo River near mouth near Buffalo City	R9	07/24/01	5.47	--	--	--	2.4	2.4	--	--	2.4	--
Buffalo River near mouth near Buffalo City	R9	07/12/02	0.17	--	<0.01	1.83	7.14	0.33	0.17	--	3.32	--
Beech Creek near mouth near Boxley	T1	06/19/01	0.2	--	--	0.3	0.59	--	0.39	--	10.2	--
Beech Creek near mouth near Boxley	T1	06/20/02	0.14	--	--	--	0.56	--	6.03	--	9.4	--
Ponca Creek near mouth near Ponca	T2	07/31/01	2.53	--	--	0.15	--	--	--	--	11.8	--
Ponca Creek near mouth near Ponca	T2	06/25/02	0.48	--	--	--	--	--	4.77	--	25.3	--
Cecil Creek near mouth near Erbie	T3	06/20/01	--	--	--	1.25	1.79	--	1.97	--	6.27	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	NSF	OKS	OMT	OTD	OZB	OZC	OZM	OZS	RBD	RBT
Cecil Creek near mouth near Erbie	T3	06/24/02	0.16	--	--	0.32	1.12	--	8.33	--	18.3	--
Mill Creek near mouth near Pruitt	T4	08/01/01	0.28	--	--	--	1.97	--	10.1	--	7.72	--
Mill Creek near mouth near Pruitt	T4	06/21/02	1	--	--	1.5	3	--	10	--	18	--
Little Buffalo River near mouth near Pruitt	T5	08/02/01	0.35	--	0.35	--	0.76	--	4.18	0.88	5.59	--
Little Buffalo River near mouth near Pruitt	T5	08/19/02	0.25	--	0.34	0.25	1.18	--	5.25	0.51	8.71	--
Big Creek near mouth near Carver	T6	08/07/01	1.11	--	--	--	0.46	0.05	18.4	0.71	2.84	--
Big Creek near mouth near Carver	T6	07/24/02	0.1	--	0.1	--	1.05	--	10.3	0.1	7.97	--
Davis Creek near mouth near Mt. Hersey	T7	08/03/01	0.51	--	0.17	1.2	--	--	3.93	--	13.5	--
Davis Creek near mouth near Mt. Hersey	T7	07/22/02	--	0.12	--	3.7	--	--	0.23	--	17.8	--
Cave Creek near mouth near Mt. Hersey	T8	08/08/01	0.82	--	--	--	0.41	--	2.33	1.1	5.76	--
Cave Creek near mouth near Mt. Hersey	T8	07/26/02	0.43	--	0.29	--	1.86	--	0.29	--	9.87	--
Richland Creek near mouth near Eula	T9	07/13/01	--	--	--	--	0.16	--	5.34	--	--	--
Calf Creek near mouth near Silver Hill	T10	06/21/01	0.21	--	--	1.84	--	--	0.42	--	7.71	--
Calf Creek near mouth near Silver Hill	T10	07/22/02	0.31	--	--	6.41	--	--	0.31	--	8.88	--
Mill Creek near mouth near Silver Hill	T11	06/22/01	0.66	--	--	--	--	--	0.11	--	3.51	--
Mill Creek near mouth near Silver Hill	T11	06/29/02	0.25	--	--	0.25	--	--	0.25	--	11.7	0.25
Bear Creek near mouth near Gilbert	T12	07/12/01	0.26	--	--	--	2.89	0.52	1.84	--	6.96	--
Bear Creek near mouth near Gilbert	T12	08/08/02	0.79	--	0.17	0.54	0.54	--	4.92	0.12	3.93	--
Brush Creek near mouth near Gilbert	T13	07/16/01	--	--	--	3.44	--	--	0.95	--	1.54	--
Brush Creek near mouth near Gilbert	T13	06/28/02	--	--	--	0.14	--	--	0.71	--	3.57	--
Tomahawk Creek near mouth near Tomahawk	T14	08/10/01	0.4	--	--	1.78	0.4	--	13.8	--	7.21	--
Tomahawk Creek near mouth near Tomahawk	T14	07/19/02	0.39	--	0.08	0.63	0.47	0.08	1.65	--	6.61	--
Water Creek near mouth near Evening Star	T15	08/21/01	0.31	--	0.13	0.13	0.38	--	2	0.19	3.81	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	NSF	OKS	OMT	OTD	OZB	OZC	OZM	OZS	RBD	RBT
Water Creek near mouth near Evening Star	T15	07/08/02	1.28	--	<0.01	<0.01	1.28	0.32	1.6	--	1.28	--
Rush Creek near mouth near Rush	T16	07/25/01	--	--	--	7.32	0.17	--	0.52	--	3.31	--
Rush Creek near mouth near Rush	T16	08/23/02	--	31.1	--	9.88	--	--	--	--	7.56	--
Clabber Creek near mouth near Rush	T17	07/27/01	0.48	--	--	0.29	0.29	--	--	--	6.63	--
Clabber Creek near mouth near Rush	T17	08/23/02	1.22	--	--	0.54	0.41	--	4.07	--	2.85	--
Big Creek near mouth near Cozahome	T18	07/10/01	--	--	--	--	2.19	0.46	0.35	--	3	--
Big Creek near mouth near Cozahome	T18	07/10/02	--	--	1.56	--	1.12	0.67	2.46	--	9.82	--
Middle Creek near mouth near Big Flat	T23	07/11/01	3.51	--	--	1.17	--	--	--	--	2.34	--
Middle Creek near mouth near Big Flat	T23	07/11/02	1.14	--	--	0.57	0.57	--	--	--	6.82	--
Leatherwood Creek near mouth near Advance	T24	07/11/01	--	--	--	--	--	--	2.83	--	14.2	--
Leatherwood Creek near mouth near Advance	T24	07/11/02	3.16	--	--	2.11	--	--	0.53	--	6.84	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	RES	RRH	SCS	SLM	SMB	SRD	SRH	SSF	STD
Buffalo River near Boxley	R1	07/31/01	--	--	--	0.16	0.78	--	--	--	0.23
Buffalo River near Boxley	R1	08/07/02	--	--	--	0.29	0.57	--	--	--	1.72
Buffalo River near Ponca	R2	07/30/01	--	--	--	5.48	2.74	--	--	--	0.38
Buffalo River near Ponca	R2	07/23/02	--	--	--	1	2.99	--	--	--	0.55
Buffalo River near Pruitt	R3	08/03/01	--	--	--	0.05	0.47	--	--	--	--
Buffalo River near Pruitt	R3	06/27/02	--	--	--	0.08	0.25	--	--	--	--
Buffalo River near Hasty	R4	07/31/01	--	--	--	--	1.7	--	--	--	--
Buffalo River near Hasty	R4	07/15/02	--	--	--	--	1.93	--	--	--	--
Buffalo River near Woolum	R5	07/18/01	--	0.08	--	--	1.91	--	--	--	--
Buffalo River near Woolum	R5	07/16/02	--	0.21	--	--	3.13	--	--	--	--
Buffalo River at Shine Eye near Gilbert	R6	07/18/01	--	--	--	0.05	2.28	--	--	--	--
Buffalo River at Shine Eye near Gilbert	R6	07/17/02	--	--	--	<0.01	2.88	--	0.13	--	--
Buffalo River at Highway 14 near Harriet	R7	07/20/01	0.16	1.03	--	0.08	3.94	--	--	--	--
Buffalo River at Highway 14 near Harriet	R7	09/13/02	--	--	--	0.1	1.29	--	--	--	--
Buffalo River near Rush	R8	07/26/01	--	--	--	--	1.62	--	--	--	--
Buffalo River near Rush	R8	07/18/02	--	--	--	--	2.21	--	--	0.08	--
Buffalo River near mouth near Buffalo City	R9	07/24/01	--	--	--	0.53	2.8	--	--	0.13	--
Buffalo River near mouth near Buffalo City	R9	07/12/02	--	--	--	--	1.99	--	--	0.17	--
Beech Creek near mouth near Boxley	T1	06/19/01	--	--	--	1.08	0.39	--	--	--	0.3
Beech Creek near mouth near Boxley	T1	06/20/02	--	--	--	0.56	0.14	--	--	--	1.12
Ponca Creek near mouth near Ponca	T2	07/31/01	--	--	--	4.61	--	--	--	--	0.6
Ponca Creek near mouth near Ponca	T2	06/25/02	--	--	--	6.68	--	--	--	--	1.19
Cecil Creek near mouth near Erbie	T3	06/20/01	--	--	--	0.18	0.72	--	--	--	0.18

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	RES	RRH	SCS	SLM	SMB	SRD	SRH	SSF	STD
Cecil Creek near mouth near Erbie	T3	06/24/02	--	--	--	0.64	0.32	--	--	--	0.32
Mill Creek near mouth near Pruitt	T4	08/01/01	--	--	--	0.14	1.4	--	--	--	--
Mill Creek near mouth near Pruitt	T4	06/21/02	--	--	--	0.5	--	--	--	--	--
Little Buffalo River near mouth near Pruitt	T5	08/02/01	--	--	--	0.12	0.35	--	--	--	--
Little Buffalo River near mouth near Pruitt	T5	08/19/02	--	--	--	0.93	1.18	--	--	--	--
Big Creek near mouth near Carver	T6	08/07/01	--	--	--	0.86	0.41	--	--	--	0.05
Big Creek near mouth near Carver	T6	07/24/02	--	--	--	1.57	0.42	--	--	--	--
Davis Creek near mouth near Mt. Hersey	T7	08/03/01	--	--	--	1.03	0.34	0.34	--	--	0.17
Davis Creek near mouth near Mt. Hersey	T7	07/22/02	--	--	--	0.35	--	2.89	--	--	0.12
Cave Creek near mouth near Mt. Hersey	T8	08/08/01	--	--	--	0.82	1.1	--	--	--	--
Cave Creek near mouth near Mt. Hersey	T8	07/26/02	--	--	--	1.72	0.86	--	--	--	--
Richland Creek near mouth near Eula	T9	07/13/01	--	0.94	--	--	0.63	--	--	--	3.3
Calf Creek near mouth near Silver Hill	T10	06/21/01	--	--	--	0.21	0.21	0.71	--	--	--
Calf Creek near mouth near Silver Hill	T10	07/22/02	--	--	--	0.39	0.31	1.62	--	--	0.23
Mill Creek near mouth near Silver Hill	T11	06/22/01	--	--	--	--	0.22	2.63	--	--	--
Mill Creek near mouth near Silver Hill	T11	06/29/02	--	--	--	0.25	--	8.21	--	--	--
Bear Creek near mouth near Gilbert	T12	07/12/01	--	--	--	1.84	1.97	--	--	--	--
Bear Creek near mouth near Gilbert	T12	08/08/02	--	--	0.5	0.41	1.12	--	--	--	0.04
Brush Creek near mouth near Gilbert	T13	07/16/01	--	--	--	2.37	--	5.34	--	--	--
Brush Creek near mouth near Gilbert	T13	06/28/02	--	--	--	0.57	--	5.71	--	--	--
Tomahawk Creek near mouth near Tomahawk	T14	08/10/01	--	--	--	0.99	1.28	--	--	--	--
Tomahawk Creek near mouth near Tomahawk	T14	07/19/02	--	--	--	0.79	1.65	--	--	--	--
Water Creek near mouth near Evening Star	T15	08/21/01	--	--	--	0.38	0.56	--	--	--	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	RES	RRH	SCS	SLM	SMB	SRD	SRH	SSF	STD
Water Creek near mouth near Evening Star	T15	07/08/02	--	--	--	0.32	0.64	--	--	--	--
Rush Creek near mouth near Rush	T16	07/25/01	--	--	--	--	0.35	16.03	--	--	0.52
Rush Creek near mouth near Rush	T16	08/23/02	--	--	--	--	--	13.95	--	--	--
Clabber Creek near mouth near Rush	T17	07/27/01	--	--	--	0.48	1.73	--	--	--	0.1
Clabber Creek near mouth near Rush	T17	08/23/02	--	--	--	0.27	1.76	--	--	--	0.14
Big Creek near mouth near Cozahome	T18	07/10/01	--	--	--	1.27	1.38	--	--	--	--
Big Creek near mouth near Cozahome	T18	07/10/02	--	--	--	2.46	0.67	--	--	--	--
Middle Creek near mouth near Big Flat	T23	07/11/01	--	--	--	0.58	5.85	--	--	0.58	--
Middle Creek near mouth near Big Flat	T23	07/11/02	--	--	--	2.84	0.57	--	--	--	--
Leatherwood Creek near mouth near Advance	T24	07/11/01	--	--	--	1.89	--	--	--	--	--
Leatherwood Creek near mouth near Advance	T24	07/11/02	--	--	--	3.16	2.11	--	--	--	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	STS	TSS	USR	WHS	WRM	WSS	WTS	YKD	YLB
Buffalo River near Boxley	R1	07/31/01	--	1.33	51.09	--	--	--	0.31	--	0.16
Buffalo River near Boxley	R1	08/07/02	--	7.44	40.92	--	--	--	0.14	--	--
Buffalo River near Ponca	R2	07/30/01	--	2.08	17.93	--	--	0.28	0.47	3.87	0.09
Buffalo River near Ponca	R2	07/23/02	--	1.11	35.03	--	--	--	0.22	0.67	0.11
Buffalo River near Pruitt	R3	08/03/01	--	8.75	26.43	--	--	0.37	1.3	3.63	0.05
Buffalo River near Pruitt	R3	06/27/02	--	1.25	36.63	--	--	--	0.58	1.83	--
Buffalo River near Hasty	R4	07/31/01	0.09	2.7	16.94	--	--	0.24	0.28	3.79	--
Buffalo River near Hasty	R4	07/15/02	--	1.65	3.58	--	--	0.28	1.38	1.19	0.09
Buffalo River near Woolum	R5	07/18/01	--	1.3	32.09	--	--	0.08	0.99	3.21	--
Buffalo River near Woolum	R5	07/16/02	--	1.95	13.97	--	--	--	0.97	0.97	0.28
Buffalo River at Shine Eye near Gilbert	R6	07/18/01	--	0.71	23.48	--	--	0.49	0.76	6.03	0.11
Buffalo River at Shine Eye near Gilbert	R6	07/17/02	--	3.13	12.16	--	--	0.5	0.5	3.88	0.25
Buffalo River at Highway 14 near Harriet	R7	07/20/01	--	0.24	16.56	--	--	1.18	3.23	1.97	0.16
Buffalo River at Highway 14 near Harriet	R7	09/13/02	--	0.31	27.4	--	--	1.45	0.16	1.55	0.26
Buffalo River near Rush	R8	07/26/01	--	0.64	29.48	--	--	1.45	1.21	0.87	--
Buffalo River near Rush	R8	07/18/02	--	0.61	21.05	--	--	1.3	1.14	<0.01	0.15
Buffalo River near mouth near Buffalo City	R9	07/24/01	1.33	2.8	26.66	--	--	0.53	0.4	9.07	--
Buffalo River near mouth near Buffalo City	R9	07/12/02	0.33	0.17	22.09	--	--	0.5	0.17	<0.01	1.16
Beech Creek near mouth near Boxley	T1	06/19/01	--	--	55.61	--	--	--	--	--	--
Beech Creek near mouth near Boxley	T1	06/20/02	--	--	52.73	--	--	--	--	--	--
Ponca Creek near mouth near Ponca	T2	07/31/01	--	0.15	58.18	--	--	--	0.15	--	--
Ponca Creek near mouth near Ponca	T2	06/25/02	--	--	22.43	--	--	--	--	--	--
Cecil Creek near mouth near Erbie	T3	06/20/01	--	8.78	44.27	--	--	0.18	1.61	--	0.36

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	STS	TSS	USR	WHS	WRM	WSS	WTS	YKD	YLB
Cecil Creek near mouth near Erbie	T3	06/24/02	--	1.28	23.72	--	--	0.16	0.16	--	--
Mill Creek near mouth near Pruitt	T4	08/01/01	--	2.25	8.01	--	--	--	--	--	--
Mill Creek near mouth near Pruitt	T4	06/21/02	--	0.5	18	--	--	--	--	--	--
Little Buffalo River near mouth near Pruitt	T5	08/02/01	--	3.82	28.71	--	--	0.24	0.18	16.65	0.06
Little Buffalo River near mouth near Pruitt	T5	08/19/02	--	0.51	25.3	--	--	0.68	0.25	9.9	0.08
Big Creek near mouth near Carver	T6	08/07/01	0.46	0.61	32.52	--	--	--	--	1.42	--
Big Creek near mouth near Carver	T6	07/24/02	0.21	0.52	28.93	--	--	--	--	4.09	0.1
Davis Creek near mouth near Mt. Hersey	T7	08/03/01	--	1.88	21.2	--	--	--	--	--	--
Davis Creek near mouth near Mt. Hersey	T7	07/22/02	--	0.12	28.55	--	--	--	--	--	--
Cave Creek near mouth near Mt. Hersey	T8	08/08/01	0.41	4.66	35.39	--	--	--	0.55	4.25	--
Cave Creek near mouth near Mt. Hersey	T8	07/26/02	0.14	0.14	24.32	--	0.14	0.14	--	5.72	--
Richland Creek near mouth near Eula	T9	07/13/01	0.78	2.35	39.56	--	--	0.78	0.16	--	0.31
Calf Creek near mouth near Silver Hill	T10	06/21/01	0.07	0.57	73.34	--	--	--	0.07	--	--
Calf Creek near mouth near Silver Hill	T10	07/22/02	--	0.23	53.36	--	--	--	--	0.15	--
Mill Creek near mouth near Silver Hill	T11	06/22/01	--	10.75	27.96	--	--	--	0.11	--	--
Mill Creek near mouth near Silver Hill	T11	06/29/02	--	0.25	46.27	--	--	--	--	--	--
Bear Creek near mouth near Gilbert	T12	07/12/01	0.52	0.39	35.7	--	--	0.39	0.13	2.62	--
Bear Creek near mouth near Gilbert	T12	08/08/02	0.17	0.04	42.82	--	--	--	0.21	0.87	0.37
Brush Creek near mouth near Gilbert	T13	07/16/01	0.24	--	64.89	--	--	--	0.24	--	--
Brush Creek near mouth near Gilbert	T13	06/28/02	--	--	72.43	--	--	--	--	0.14	--
Tomahawk Creek near mouth near Tomahawk	T14	08/10/01	0.2	2.57	33.5	--	--	0.1	0.2	0.3	--
Tomahawk Creek near mouth near Tomahawk	T14	07/19/02	0.16	0.24	51.46	--	--	0.16	--	0.39	0.31
Water Creek near mouth near Evening Star	T15	08/21/01	0.06	0.56	59.19	--	--	1.31	1.13	0.38	--

Table 2. Species richness and percent relative abundance for sites sampled in 2001 and 2002 within Buffalo National River, Arkansas.—Continued

[Species codes are defined in table 3. USR, unidentified stoneroller, counted as two species for species richness; <, less than]

Site name	Site identifier	Date	STS	TSS	USR	WHS	WRM	WSS	WTS	YKD	YLB
Water Creek near mouth near Evening Star	T15	07/08/02	--	<0.01	40.38	--	--	0.32	0.32	--	0.64
Rush Creek near mouth near Rush	T16	07/25/01	--	--	23	--	--	--	0.7	--	--
Rush Creek near mouth near Rush	T16	08/23/02	--	--	13.37	--	--	--	--	--	--
Clabber Creek near mouth near Rush	T17	07/27/01	--	0.38	48.7	--	--	--	1.06	0.1	--
Clabber Creek near mouth near Rush	T17	08/23/02	--	1.09	39.08	--	--	--	0.27	--	0.14
Big Creek near mouth near Cozahome	T18	07/10/01	--	0.46	41.71	--	--	0.35	0.23	6.8	0.35
Big Creek near mouth near Cozahome	T18	07/10/02	--	--	37.05	--	0	--	0.45	2.01	0.67
Middle Creek near mouth near Big Flat	T23	07/11/01	--	--	8.77	--	--	0.58	5.26	--	--
Middle Creek near mouth near Big Flat	T23	07/11/02	--	--	31.82	--	--	--	--	--	0.57
Leatherwood Creek near mouth near Advance	T24	07/11/01	0.94	0.94	19.81	0.94	--	--	1.89	--	0.94
Leatherwood Creek near mouth near Advance	T24	07/11/02	--	--	24.74	--	--	--	1.05	--	--

Table 3. List of species codes used in table 2.

[NA, not applicable]

Common name	Scientific name	Species code	Common name	Scientific name	Species code
Arkansas saddled darter	<i>Etheostoma euzonum</i>	ASD	Northern studfish	<i>Fundulus catenatus</i>	NSF
Banded darter	<i>Etheostoma zonale</i>	BDD	Orangethroat darter	<i>Etheostoma spectabile</i>	OTD
Banded sculpin	<i>Cottus carolinae</i>	BDS	Ozark bass	<i>Ambloplites constellatus</i>	OZB
Bigeye chub	<i>Hybopsis amblops</i>	BEC	Ozark chub	<i>Erimystax harrisi</i>	OZC
Bigeye shiner	<i>Notropis boops</i>	BES	Ozark madtom	<i>Noturus albater</i>	OMT
Black redhorse	<i>Moxostoma duquesnei</i>	BRH	Ozark minnow	<i>Notropis nubilus</i>	OZM
Blackspotted topminnow	<i>Fundulus olivaceus</i>	BTM	Ozark sculpin	<i>Cottus hypselurus</i>	OKS
Bluegill	<i>Lepomis macrochirus</i>	BLG	Ozark shiner	<i>Notropis ozarcanus</i>	OZS
Bluntnose minnow	<i>Pimephales notatus</i>	BNM	Rainbow darter	<i>Etheostoma caeruleum</i>	RBD
Brook silverside	<i>Labidesthes sicculus</i>	BRS	Rainbow trout	<i>Oncorhynchus mykiss</i>	RBT
Carmine shiner	<i>Notropis percobromus</i>	CMS	Redear sunfish	<i>Lepomis microlophus</i>	RES
Checkered madtom	<i>Noturus flavater</i>	CKM	Redspotted sunfish	<i>Lepomis miniatus</i>	SSF
Chestnut lamprey	<i>Ichthyomyzon castaneus</i>	CNL	River redhorse	<i>Moxostoma carinatum</i>	RRH
Common carp	<i>Cyprinus carpio</i>	CMC	Shorthead redhorse	<i>Moxostoma macrolepidotum</i>	SRH
Creek chub	<i>Semotilus atromaculatus</i>	CRC	Slender madtom	<i>Noturus exilis</i>	SLM
Duskystripe shiner	<i>Luxilus pilsbryi</i>	DSS	Smallmouth bass	<i>Micropterus dolomieu</i>	SMB
Flathead catfish	<i>Pylodictis olivaris</i>	FHC	Southern redbelly dace	<i>Phoxinus erythrogaster</i>	SRD
Gilt darter	<i>Percina evides</i>	GTD	Steelcolor shiner	<i>Cyprinella whipplei</i>	SCS
Golden redhorse	<i>Moxostoma erythrurum</i>	GRH	Stippled darter	<i>Etheostoma punctulatum</i>	STD
Green sunfish	<i>Lepomis cyanellus</i>	GSF	Stoneroller, unidentified	<i>Campostoma spp.</i>	USR
Greenside darter	<i>Etheostoma blennioides</i>	GSD	Striped shiner	<i>Luxilus chrysocephalus</i>	STS
Hornyhead chub	<i>Nocomis biguttatus</i>	HHC	Telescope shiner	<i>Notropis telescopus</i>	TSS
Lamprey, immature	NA	AMM	Warmouth	<i>Lepomis gulosus</i>	WRM
Largemouth bass	<i>Micropterus salmoides</i>	LMB	Wedgespot shiner	<i>Notropis greenei</i>	WSS
Logperch	<i>Percina caprodes</i>	LGP	White sucker	<i>Catostomus commersoni</i>	WHS
Longear sunfish	<i>Lepomis megalotis</i>	LES	Whitetail shiner	<i>Cyprinella galactura</i>	WTS
Longnose gar	<i>Lepisosteus osseus</i>	LNG	Yellow bullhead	<i>Ameiurus natalis</i>	YLB
Northern hog sucker	<i>Hypentelium nigricans</i>	NHS	Yoke darter	<i>Etheostoma juliae</i>	YKD

Table 4. List of species collected within Buffalo National River, Arkansas.

[--, not collected; X, collected; species endemic to the Ozark Plateaus physiographic area are shaded; for 2003, only species not collected in 2001-2002 are shown]

Common name	Scientific name	2001-2002	2003	Cashner and Brown (1977)	Guidroz (1975)	Robison and Buchanan (1988)	Walters (1993)
American brook lamprey	<i>Lampetra appendix</i>	--	--	X	X	X	--
American eel	<i>Anguilla rostrata</i>	--	X	X	X	X	X
Arkansas saddled darter	<i>Etheostoma euzonum</i>	X	--	X	X	X	X
Banded darter	<i>Etheostoma zonale</i>	X	--	X	X	X	X
Banded sculpin	<i>Cottus carolinae</i>	X	--	X	X	X	X
Bigeye chub	<i>Hybopsis amblops</i>	X	--	X	X	X	X
Bigeye shiner	<i>Notropis boops</i>	X	--	X	X	X	X
Black bullhead	<i>Ameiurus melas</i>	--	--	X	X	--	--
Black crappie	<i>Pomoxis nigromaculatus</i>	--	X	--	--	--	X
Black redhorse	<i>Moxostoma duquesnei</i>	X	--	X	X	X	X
Blackside darter	<i>Percina maculata</i>	--	--	X	--	X	--
Blackspotted topminnow	<i>Fundulus olivaceus</i>	X	--	X	X	X	X
Bluegill	<i>Lepomis macrochirus</i>	X	--	X	X	X	X
Bluntnose minnow	<i>Pimephales notatus</i>	X	--	X	X	X	X
Brook silverside	<i>Labidesthes sicculus</i>	X	--	X	X	X	X
Brown trout	<i>Salmo trutta</i>	--	X	--	--	--	--
Carmine shiner ^a	<i>Notropis percobromus</i>	X	--	X	X	X	X
Channel catfish	<i>Ictalurus punctatus</i>	--	X	X	X	X	X
Checkered madtom	<i>Noturus flavater</i>	X	--	X	X	X	X
Chestnut lamprey	<i>Ichthyomyzon castaneus</i>	X	--	X	X	X	X
Common carp	<i>Cyprinus carpio</i>	X	--	--	--	X	--
Creek chub	<i>Semotilus atromaculatus</i>	X	--	X	X	X	X
Duskystripe shiner	<i>Luxilus pilsbryi</i>	X	--	X	X	X	X
Flathead catfish	<i>Pylodictis olivaris</i>	X	--	X	X	X	X
Freshwater drum	<i>Aplodinotus grunniens</i>	--	X	--	--	--	--
Gilt darter	<i>Percina evides</i>	X	--	X	X	X	X
Gizzard shad	<i>Dorosoma cepedianum</i>	--	X	X	X	X	X
Golden redhorse	<i>Moxostoma erythrurum</i>	X	--	X	X	X	X
Green sunfish	<i>Lepomis cyanellus</i>	X	--	X	X	X	X
Greenside darter	<i>Etheostoma blennioides</i>	X	--	X	X	X	X
Highfin carpsucker	<i>Carpionodes velifer</i>	--	--	X	--	X	--
Hornyhead chub	<i>Nocomis biguttatus</i>	X	--	X	X	X	X
Largemouth bass	<i>Micropterus salmoides</i>	X	--	X	X	X	X
Least brook lamprey	<i>Lampetra aepyptera</i>	--	X	--	--	--	--
Logperch	<i>Percina caprodes</i>	X	--	X	X	X	X
Longear sunfish	<i>Lepomis megalotis</i>	X	--	X	X	X	X
Longnose gar	<i>Lepisosteus osseus</i>	X	--	X	X	X	X
Northern hog sucker	<i>Hypentelium nigricans</i>	X	--	X	X	X	X
Northern studfish	<i>Fundulus catenatus</i>	X	--	X	X	X	X
Orangethroat darter	<i>Etheostoma spectabile</i>	X	--	X	X	--	X

Table 4. List of species collected within Buffalo National River, Arkansas.—Continued

[--, not collected; X, collected; species endemic to the Ozark Plateaus physiographic area are shaded; for 2003, only species not collected in 2001-2002 are shown]

Common name	Scientific name	2001-2002	2003	Cashner and Brown (1977)	Guidroz (1975)	Robison and Buchanan (1988)	Walters (1993)
Ozark bass	<i>Ambloplites constellatus</i>	X	--	X	X	X	X
Ozark chub	<i>Erimystax harrisi</i>	X	--	X	X	X	X
Ozark madtom	<i>Noturus albatris</i>	X	--	X	X	X	X
Ozark minnow	<i>Notropis nubilus</i>	X	--	X	X	X	X
Ozark sculpin	<i>Cottus hypselurus</i>	X	--	X	X	X	X
Ozark shiner	<i>Notropis ozarcanus</i>	X	--	X	X	X	X
Quillback	<i>Carpionodes cyprinus</i>	--	X	--	--	--	--
Rainbow darter	<i>Etheostoma caeruleum</i>	X	--	X	X	X	X
Rainbow trout	<i>Oncorhynchus mykiss</i>	X	--	--	--	X	--
Redear sunfish	<i>Lepomis microlophus</i>	X	--	--	--	--	X
Redspotted sunfish	<i>Lepomis miniatus</i>	X	--	--	--	--	--
River carpsucker	<i>Carpionodes carpio</i>	--	--	--	--	--	X
River redhorse	<i>Moxostoma carinatum</i>	X	--	X	X	X	X
Shorthead redhorse	<i>Moxostoma macrolepidotum</i>	X	--	--	--	--	--
Slender madtom	<i>Noturus exilis</i>	X	--	X	X	X	X
Smallmouth bass	<i>Micropterus dolomieu</i>	X	--	X	X	X	X
Southern redbelly dace	<i>Phoxinus erythrogaster</i>	X	--	X	X	X	X
Speckled darter	<i>Etheostoma stigmaeum</i>	--	--	X	X	X	--
Spotted bass	<i>Micropterus punctulatus</i>	--	--	X	X	X	--
Spotted sucker	<i>Minytrema melanops</i>	--	X	--	--	X	--
Steelcolor shiner	<i>Cyprinella whipplei</i>	X	--	X		X	--
Stippled darter	<i>Etheostoma punctulatum</i>	X	--	X	X	X	X
Stoneroller ^b	<i>Camptostoma spp.</i>	X	--	X ²	X ²	X ²	X ²
Striped shiner	<i>Luxilus chrysocephalus</i>	X	--	X	X	X	X
Telescope shiner	<i>Notropis telescopus</i>	X	--	X	X	X	X
Walleye	<i>Sander vitreus</i>	--	X	--	--	--	--
Warmouth	<i>Lepomis gulosus</i>	X	--	--	--	--	--
Wedgespot shiner	<i>Notropis greenei</i>	X	--	X	X	X	X
White bass	<i>Morone chrysops</i>	--	--	--	--	X	--
White sucker	<i>Catostomus commersoni</i>	X	--	--	--	--	--
Whitetail shiner	<i>Cyprinella galactura</i>	X	--	X	X	X	X
Yellow bullhead	<i>Ameiurus natalis</i>	X	--	X	X	X	--
Yoke darter	<i>Etheostoma juliae</i>	X	--	X	X	X	X
Number of species collected ²		56 ²	10	58 ²	55 ²	60 ²	53

^aFormerly considered rosyface shiner (*Notropis rubellus*).

^bIncludes both species of stonerollers (*C. anomalum* and *C. oligolepis*).

Table 5. Qualitative abundance of species at sites sampled in 2003 where all encountered species were collected, Buffalo National River, Arkansas.

[--, not collected; 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); NA, not applicable]

Common name	Scientific name	T6.8 ^a 05/08/03	T7.1 ^b 05/08/03	T14.9 ^b 05/06/03	T24.5 ^a 05/07/03
Arkansas saddled darter	<i>Etheostoma euzonum</i>	--	--	LC	--
Banded darter	<i>Etheostoma zonale</i>	--	--	R	--
Banded sculpin	<i>Cottus carolinae</i>	MC	--	C	LC
Blackspotted topminnow	<i>Fundulus olivaceus</i>	--	--	R	--
Bluntnose minnow	<i>Pimephales notatus</i>	--	--	R	--
Carmine shiner	<i>Notropis percobromus</i>	--	--	R	--
Central stoneroller	<i>Campostoma anomalum</i>	--	--	C	--
Creek chub	<i>Semotilus atromaculatus</i>	--	--	R	LC
Duskystripe shiner	<i>Luxilus pilsbryi</i>	MC	--	MC	MC
Green sunfish	<i>Lepomis cyanellus</i>	--	--	R	--
Greenside darter	<i>Etheostoma blennioides</i>	LC	--	R	--
Hornyhead chub	<i>Nocomis biguttatus</i>	--	--	R	--
Lamprey, immature	NA	--	--	R	--
Largescale stoneroller	<i>Campostoma oligolepis</i>	--	--	C	--
Least brook lamprey	<i>Lampetra aepyptera</i>	--	R	--	--
Longear sunfish	<i>Lepomis megalotis</i>	--	--	C	LC
Northern hog sucker	<i>Hypentelium nigricans</i>	--	--	R	--
Orangethroat darter	<i>Etheostoma spectabile</i>	C	R	--	LC
Ozark bass	<i>Ambloplites constellatus</i>	--	--	R	--
Ozark chub	<i>Erimystax harrisi</i>	--	--	R	--
Ozark sculpin	<i>Cottus hypselurus</i>	--	MC	MC	--
Rainbow darter	<i>Etheostoma caeruleum</i>	MC	--	MC	LC
Rainbow trout	<i>Oncorhynchus mykiss</i>	--	--	--	R
Slender madtom	<i>Noturus exilis</i>	--	--	R	--
Southern redbelly dace	<i>Phoxinus erythrogaster</i>	MC	--	--	--
Stippled darter	<i>Etheostoma punctulatum</i>	--	--	--	R
Stoneroller	<i>Campostoma spp.</i>	LC	R	--	LC
Yellow bullhead	<i>Ameiurus natalis</i>	--	--	R	--

^aQualitative abundance from counts of individuals.

^bQualitative abundance estimated using professional judgment.

Table 6. List of collected species at sites sampled in 2003 where only selected species were collected, Buffalo National River, Arkansas.

[Only species of interest were collected. Species could have been collected for photographing or because their presence was considered to be unusual. Many species not on this list could have been present at the sites. X, collected; --, not collected]

Common name	Scientific name	Site identifier and date										
		R4 4/24	R5.9 4/23	R6 4/23	R6 9/17	R6.5 5/6	R7 4/23	R8 9/16	R8.5 5/8	R9.5 3/19	R9.5 9/15	T10 4/24
American eel	<i>Anguilla rostrata</i>	--	--	--	--	--	--	--	--	--	X	--
Arkansas saddled darter	<i>Etheostoma euzonum</i>	--	--	--	--	--	X	--	--	--	--	--
Banded darter	<i>Etheostoma zonale</i>	X	--	--	--	--	--	--	--	--	--	--
Banded sculpin	<i>Cottus carolinae</i>	--	X	--	--	--	--	--	--	--	--	--
Bigeye chub	<i>Hybopsis amblops</i>	--	--	--	--	--	--	X	--	--	--	--
Bigeye shiner	<i>Notropis boops</i>	X	--	--	--	--	--	--	X	--	--	--
Black crappie	<i>Pomoxis nigromaculatus</i>	--	--	--	--	--	--	--	--	--	X	--
Black redhorse	<i>Moxostoma duquesnei</i>	--	--	--	--	--	--	X	--	--	--	--
Bluegill	<i>Lepomis macrochirus</i>	--	--	--	--	--	--	--	X	X	--	--
Bluntnose minnow	<i>Pimephales notatus</i>	--	--	--	--	--	--	--	X	--	--	--
Brook silverside	<i>Labidesthes sicculus</i>	--	--	X	--	--	--	--	--	--	--	--
Carmine shiner	<i>Notropis percobromus</i>	--	--	--	--	--	--	--	--	X	--	--
Central stoneroller	<i>Campostoma anomalum</i>	X	--	--	--	--	--	--	--	--	--	--
Channel catfish	<i>Ictalurus punctatus</i>	--	--	--	--	--	--	X	X	X	--	--
Checkered madtom	<i>Noturus flavater</i>	X	--	--	--	--	--	--	--	--	--	--
Chestnut lamprey	<i>Ichthyomyzon castaneus</i>	X	--	--	--	--	--	--	--	X	--	--
Common carp	<i>Cyprinus carpio</i>	--	--	--	--	--	--	--	--	--	X	--
Duskystripe shiner	<i>Luxilus pilsbryi</i>	X	X	--	--	--	--	--	--	--	--	--
Flathead catfish	<i>Pylodictis olivaris</i>	--	--	--	--	--	--	--	--	X	--	--
Freshwater drum	<i>Aplodinotus grunniens</i>	--	--	--	--	--	--	--	--	--	X	--
Gizzard shad	<i>Dorosoma cepedianum</i>	--	--	--	--	--	--	--	X	--	--	--
Golden redhorse	<i>Moxostoma erythrurum</i>	--	--	--	--	--	--	X	X	X	--	--
Green sunfish	<i>Lepomis cyanellus</i>	--	--	--	--	--	--	--	X	--	--	--
Greenside darter	<i>Etheostoma blennioides</i>	X	--	--	--	--	--	--	--	--	--	--
Largemouth bass	<i>Micropterus salmoides</i>	--	--	--	--	--	--	--	X	X	--	--
Largescale stoneroller	<i>Campostoma oligolepis</i>	X	X	X	--	--	--	--	--	X	--	X
Longear sunfish	<i>Lepomis megalotis</i>	--	--	--	--	--	--	X	--	X	--	--
Longnose gar	<i>Lepisosteus osseus</i>	--	--	--	--	--	--	--	X	--	--	--
Northern studfish	<i>Fundulus catenatus</i>	--	--	--	--	--	--	X	--	--	--	--
Ozark bass	<i>Ambloplites constellatus</i>	--	--	--	--	--	--	X	--	X	--	--

Table 6. List of collected species at sites sampled in 2003 where only selected species were collected, Buffalo National River, Arkansas.—Continued

[Only species of interest were collected. Species could have been collected for photographing or because their presence was considered to be unusual. Many species not on this list could have been present at the sites. X, collected; --, not collected]

Common name	Scientific name	Site identifier and date										
		R4 4/24	R5.9 4/23	R6 4/23	R6 9/17	R6.5 5/6	R7 4/23	R8 9/16	R8.5 5/8	R9.5 3/19	R9.5 9/15	T10 4/24
Ozark chub	<i>Erimystax harrayi</i>	--	--	--	--	X	--	--	--	--	--	--
Ozark madtom	<i>Noturus albater</i>	--	--	--	X	X	--	--	--	--	--	--
Quillback	<i>Carpionodes cyprinus</i>	--	--	--	--	--	--	--	--	X	--	--
Ozark minnow	<i>Notropis nubilus</i>	--	--	X	--	X	--	--	--	--	--	--
Ozark shiner	<i>Notropis ozarcanus</i>	--	--	X	--	--	--	--	--	--	--	--
Rainbow trout	<i>Oncorhynchus mykiss</i>	--	X	--	--	--	--	--	--	X	--	--
Redear sunfish	<i>Lepomis microlophus</i>	--	--	--	--	--	--	--	--	X	--	--
River redhorse	<i>Moxostoma carinatum</i>	--	--	--	--	--	--	--	--	X	--	--
Smallmouth bass	<i>Micropterus dolomieu</i>	--	--	--	--	--	--	--	--	X	--	--
Southern redbelly dace	<i>Phoxinus erythrogaster</i>	--	--	--	--	X	--	--	--	--	--	--
Spotted sucker	<i>Minytrema melanops</i>	--	--	--	--	--	--	--	X	--	--	--
Stippled darter	<i>Etheostoma punctulatum</i>	--	--	--	--	--	--	--	--	--	--	--
Striped shiner	<i>Luxilus chrysocephalus</i>	--	--	--	--	--	X	X	--	--	--	--
Telescope shiner	<i>Notropis telescopus</i>	--	--	--	X	--	--	--	--	--	--	--
Walleye	<i>Sander vitreus</i>	--	--	--	--	--	--	--	--	X	--	--
Warmouth	<i>Lepomis gulosus</i>	--	--	--	--	--	--	--	X	--	--	--
Wedgespot shiner	<i>Notropis greenei</i>	--	X	--	--	--	--	--	--	--	--	--
Whitetail shiner	<i>Cyprinella galactura</i>	--	--	--	--	--	--	--	--	--	X	--
Yellow bullhead	<i>Ameiurus natalis</i>	--	--	--	--	--	--	X	--	--	--	--
Yoke darter	<i>Etheostoma juliae</i>	--	--	--	X	X	--	--	--	--	--	--

Table 7. List of fish species expected to occur at Buffalo National River, Arkansas.

Preliminary list, list provided by National Park Service; Revised list, list compiled by USGS after review of pertinent literature; USGS, collected by USGS in 2001-2003; 0, unexpected, Buffalo National River is outside of species' range or lacks appropriate habitat; 1, species is expected within Buffalo National River; 2, collected; WRB, White River Basin. Comments based on information from Robison and Buchanan (1988)]

Family	Scientific name	Common name	Preliminary list	Revised list	USGS	Comment
Acipenseridae	<i>Scaphirhynchus platyrhynchus</i>	Shovelnose sturgeon	1	0	No	Not reported from this part of WRB
Amblyopsidae	<i>Typhlichthys subterraneus</i>	Southern cavefish	1	0	No	Restricted to caves
Anguillidae	<i>Anguilla rostrata</i>	American eel	2	2	Yes	
Atherinidae	<i>Labidesthes sicculus</i>	Brook silverside	2	2	Yes	
Catostomidae	<i>Moxostoma duquesnei</i>	Black redhorse	2	2	Yes	
Catostomidae	<i>Erimyzon oblongus</i>	Creek chubsucker	1	0	No	Not reported from this part of WRB
Catostomidae	<i>Moxostoma erythrurum</i>	Golden redhorse	2	2	Yes	
Catostomidae	<i>Carpiodes velifer</i>	Highfin carpsucker	2	2	No	
Catostomidae	<i>Hypentelium nigricans</i>	Northern hog sucker	2	2	Yes	
Catostomidae	<i>Carpiodes cyprinus</i>	Quillback	1	2	Yes	
Catostomidae	<i>Carpiodes carpio</i>	River carpsucker	2	2	No	
Catostomidae	<i>Moxostoma carinatum</i>	River redhorse	2	2	Yes	
Catostomidae	<i>Moxostoma macrolepidotum</i>	Shorthead redhorse	1	2	Yes	
Catostomidae	<i>Minytrema melanops</i>	Spotted sucker	2	2	Yes	
Catostomidae	<i>Catostomus commersoni</i>	White sucker	1	2	Yes	
Centrarchidae	<i>Pomoxis nigromaculatus</i>	Black crappie	2	2	Yes	
Centrarchidae	<i>Lepomis macrochirus</i>	Bluegill	2	2	Yes	
Centrarchidae	<i>Lepomis cyanellus</i>	Green sunfish	2	2	Yes	
Centrarchidae	<i>Micropterus salmoides</i>	Largemouth bass	2	2	Yes	
Centrarchidae	<i>Lepomis megalotis</i>	Longear sunfish	2	2	Yes	
Centrarchidae	<i>Lepomis humilis</i>	Orangespotted sunfish	1	0	No	Not reported from this part of WRB
Centrarchidae	<i>Ambloplites constellatus</i>	Ozark bass	2	2	Yes	
Centrarchidae	<i>Lepomis auritus</i>	Redbreast sunfish	1	0	No	Introduced species, no recent collections from Arkansas
Centrarchidae	<i>Lepomis microlophus</i>	Redear sunfish	2	2	Yes	
Centrarchidae	<i>Lepomis miniatus</i>	Redspotted sunfish	1	2	Yes	
Centrarchidae	<i>Micropterus dolomieu</i>	Smallmouth bass	2	2	Yes	
Centrarchidae	<i>Micropterus punctulatus</i>	Spotted bass	2	2	No	
Centrarchidae	<i>Lepomis gulosus</i>	Warmouth	1	2	Yes	
Centrarchidae	<i>Pomoxis annularis</i>	White crappie	1	1	No	
Clupeidae	<i>Dorosoma cepedianum</i>	Gizzard shad	2	2	Yes	

Table 7. List of fish species expected to occur at Buffalo National River, Arkansas.—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 2001-2003; 0, unexpected, Buffalo National River is outside of species' range or lacks appropriate habitat; 1, species is expected within Buffalo National River; 2, collected; WRB, White River Basin. Comments based on information from Robison and Buchanan (1988)]

Family	Scientific name	Common name	Preliminary list	Revised list	USGS	Comment
Clupeidae	<i>Alosa chrysochloris</i>	Skipjack herring	1	0	No	Not reported from this part of WRB
Clupeidae	<i>Dorosoma petenense</i>	Threadfin shad	1	0	No	In Ozarks, primarily restricted to reservoirs
Cottidae	<i>Cottus carolinae</i>	Banded sculpin	2	2	Yes	
Cottidae	<i>Cottus hypselurus</i>	Ozark sculpin	2	2	Yes	
Cyprinidae	<i>Hybopsis amblops</i>	Bigeye chub	2	2	Yes	
Cyprinidae	<i>Notropis boops</i>	Bigeye shiner	2	2	Yes	
Cyprinidae	<i>Cyprinella venusta</i>	Blacktail shiner	1	0	No	Not reported from Ozark Plateaus
Cyprinidae	<i>Cyprinella camura</i>	Bluntnose shiner	1	0	No	Does not occur in WRB
Cyprinidae	<i>Pimephales notatus</i>	Bluntnose minnow	2	2	Yes	
Cyprinidae	<i>Pimephales vigilax</i>	Bullhead minnow	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Notropis percobromus</i>	Carmine shiner ^a	2	2	Yes	
Cyprinidae	<i>Campostoma anomalum</i>	Central stoneroller	2	2	Yes	
Cyprinidae	<i>Cyprinus carpio</i>	Common carp	2	2	Yes	
Cyprinidae	<i>Semotilus atromaculatus</i>	Creek chub	2	2	Yes	
Cyprinidae	<i>Luxilus pilsbryi</i>	Duskystripe shiner	2	2	Yes	
Cyprinidae	<i>Pimephales promelas</i>	Fathead minnow	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Notemigonus crysoleucas</i>	Golden shiner	2	1	No	Previous reports probably outside of park
Cyprinidae	<i>Carassius auratus</i>	Goldfish	1	0	No	An introduced species with low survival
Cyprinidae	<i>Ctenopharyngodon idella</i>	Grass carp	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Erimystax x-punctatus</i>	Gravel chub	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Nocomis biguttatus</i>	Hornyhead chub	2	2	Yes	
Cyprinidae	<i>Campostoma oligolepis</i>	Largescale stoneroller	2	2	Yes	
Cyprinidae	<i>Notropis volucellus</i>	Mimic shiner	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Hybognathus nuchalis</i>	Mississippi silvery minnow	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Erimystax harrayi</i>	Ozark chub	2	2	Yes	
Cyprinidae	<i>Notropis nubilus</i>	Ozark minnow	2	2	Yes	

Table 7. List of fish species expected to occur at Buffalo National River, Arkansas.—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 2001-2003; 0, unexpected, Buffalo National River is outside of species' range or lacks appropriate habitat; 1, species is expected within Buffalo National River; 2, collected; WRB, White River Basin. Comments based on information from Robison and Buchanan (1988)]

Family	Scientific name	Common name	Preliminary list	Revised list	USGS	Comment
Cyprinidae	<i>Notropis ozarcanus</i>	Ozark shiner	2	2	Yes	
Cyprinidae	<i>Lythrurus umbratilis</i>	Redfin shiner	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Nocomis asper</i>	Redspot chub	1	0	No	Does not occur in WRB
Cyprinidae	<i>Notropis sabiniae</i>	Sabine shiner	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Pimephales tenellus</i>	Slim minnow	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Phoxinus erythrogaster</i>	Southern redbelly dace	2	2	Yes	
Cyprinidae	<i>Cyprinella spiloptera</i>	Spotfin shiner	1	0	No	Not reported from this part of WRB
Cyprinidae	<i>Cyprinella whipplei</i>	Steelcolor shiner	2	2	Yes	
Cyprinidae	<i>Luxilus chrysocephalus</i>	Striped shiner	2	2	Yes	
Cyprinidae	<i>Notropis telescopus</i>	Telescope shiner	2	2	Yes	
Cyprinidae	<i>Notropis greenei</i>	Wedgespot shiner	2	2	Yes	
Cyprinidae	<i>Cyprinella galactura</i>	Whitetail shiner	2	2	Yes	
Esocidae	<i>Esox niger</i>	Chain pickerel	1	0	No	Not reported from this part of WRB
Esocidae	<i>Esox americanus</i>	Grass pickerel	1	0	No	Not reported from this part of WRB
Esocidae	<i>Esox masquinongy</i>	Muskellunge	1	0	No	Not reported from this part of WRB
Esocidae	<i>Esox lucius</i>	Northern pike	1	0	No	Not reported from this part of WRB
Fundulidae	<i>Fundulus olivaceus</i>	Blackspotted topminnow	2	2	Yes	
Fundulidae	<i>Fundulus catenatus</i>	Northern studfish	2	2	Yes	
Hiodontidae	<i>Hiodon tergisus</i>	Mooneye	1	0	No	Not reported from this part of WRB
Ictaluridae	<i>Ameiurus melas</i>	Black bullhead	2	2	No	
Ictaluridae	<i>Ictalurus furcatus</i>	Blue catfish	1	0	No	Primarily an inhabitant of big rivers
Ictaluridae	<i>Noturus miurus</i>	Brindled madtom	1	0	No	Not reported from this part of WRB
Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	2	2	Yes	
Ictaluridae	<i>Noturus flavater</i>	Checkered madtom	2	2	Yes	
Ictaluridae	<i>Pylodictis olivaris</i>	Flathead catfish	2	2	Yes	
Ictaluridae	<i>Noturus albatere</i>	Ozark madtom	2	2	Yes	

Table 7. List of fish species expected to occur at Buffalo National River, Arkansas.—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 2001-2003; 0, unexpected, Buffalo National River is outside of species' range or lacks appropriate habitat; 1, species is expected within Buffalo National River; 2, collected; WRB, White River Basin. Comments based on information from Robison and Buchanan (1988)]

Family	Scientific name	Common name	Preliminary list	Revised list	USGS	Comment
Ictaluridae	<i>Noturus exilis</i>	Slender madtom	2	2	Yes	
Ictaluridae	<i>Ameiurus natalis</i>	Yellow bullhead	2	2	Yes	
Lepisosteidae	<i>Atractosteus spatula</i>	Alligator gar	1	0	No	Not reported from Ozark Plateaus
Lepisosteidae	<i>Lepisosteus osseus</i>	Longnose gar	2	2	Yes	
Lepisosteidae	<i>Lepisosteus platostomus</i>	Shortnose gar	1	0	No	Not reported from this part of WRB
Lepisosteidae	<i>Lepisosteus oculatus</i>	Spotted gar	1	0	No	Not reported from this part of WRB
Moronidae	<i>Morone saxatilis</i>	Striped bass	1	0	No	Not reported from this part of WRB
Moronidae	<i>Morone chrysops</i>	White bass	2	2	No	
Percidae	<i>Etheostoma euzonum</i>	Arkansas saddled darter	2	2	Yes	
Percidae	<i>Etheostoma zonale</i>	Banded darter	2	2	Yes	
Percidae	<i>Percina maculata</i>	Blackside darter	2	2	No	
Percidae	<i>Etheostoma chlorosomum</i>	Bluntnose darter	1	0	No	Not reported from this part of WRB
Percidae	<i>Percina sciera</i>	Dusky darter	1	0	No	Not reported from this part of WRB
Percidae	<i>Etheostoma flabellare</i>	Fantail darter	1	0	No	Absent from most of WRB in vicinity
Percidae	<i>Percina evides</i>	Gilt darter	2	2	Yes	
Percidae	<i>Etheostoma blennioides</i>	Greenside darter	2	2	Yes	
Percidae	<i>Percina caprodes</i>	Logperch	2	2	Yes	
Percidae	<i>Percina nasuta</i>	Longnose darter	1	0	No	Not reported from this part of WRB
Percidae	<i>Etheostoma spectabile</i>	Orangethroat darter	2	2	Yes	
Percidae	<i>Etheostoma caeruleum</i>	Rainbow darter	2	2	Yes	
Percidae	<i>Etheostoma whipplei</i>	Redfin darter	1	0	No	Not reported from this part of WRB
Percidae	<i>Percina shumardi</i>	River darter	1	0	No	Not reported from this part of WRB
Percidae	<i>Percina vigil</i>	Saddleback darter	1	0	No	Not reported from this part of WRB
Percidae	<i>Sander canadensis</i>	Sauger	1	0	No	Not reported from this part of WRB
Percidae	<i>Ammocrypta vivax</i>	Scaly sand darter	1	0	No	Not reported from this part of WRB

Table 7. List of fish species expected to occur at Buffalo National River, Arkansas.—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 2001-2003; 0, unexpected, Buffalo National River is outside of species' range or lacks appropriate habitat; 1, species is expected within Buffalo National River; 2, collected; WRB, White River Basin. Comments based on information from Robison and Buchanan (1988)]

Family	Scientific name	Common name	Preliminary list	Revised list	USGS	Comment
Percidae	<i>Etheostoma stigmaeum</i>	Speckled darter	2	2	No	
Percidae	<i>Percina uranidea</i>	Stargazing darter	1	0	No	Not reported from this part of WRB
Percidae	<i>Etheostoma punctulatum</i>	Stippled darter	2	2	Yes	
Percidae	<i>Sander vitreus</i>	Walleye	1	2	Yes	
Percidae	<i>Ammocrypta clara</i>	Western sand darter	1	0	No	Not reported from this part of WRB
Percidae	<i>Etheostoma juliae</i>	Yoke darter	2	2	Yes	
Petromyzontidae	<i>Lampetra appendix</i>	American brook lamprey	2	2	No	
Petromyzontidae	<i>Ichthyomyzon cataneus</i>	Chestnut lamprey	2	2	Yes	
Petromyzontidae	<i>Lampetra aepyptera</i>	Least brook lamprey	1	2	Yes	
Petromyzontidae	<i>Ichthyomyzon gagei</i>	Southern brook lamprey	1	0	No	Not reported from this part of WRB
Poeciliidae	<i>Gambusia affinis</i>	Western mosquitofish	1	0	No	Not reported from this part of WRB
Polyodontidae	<i>Polyodon spathula</i>	Paddlefish	1	0	No	Not reported from this part of WRB
Salmonidae	<i>Salvelinus fontinalis</i>	Brook trout	1	1	No	
Salmonidae	<i>Salmo trutta</i>	Brown trout	1	2	No	Observed by National Park Service
Salmonidae	<i>Oncorhynchus clarki</i>	Cutthroat trout	1	1	No	
Salmonidae	<i>Salvelinus namaycush</i>	Lake trout	1	0	No	Mostly restricted to deep, cold lakes
Salmonidae	<i>Oncorhynchus mykiss</i>	Rainbow trout	2	2	Yes	
Sciaenidae	<i>Aplodinotus grunniens</i>	Freshwater drum	1	2	Yes	

^aFormerly considered rosyface shine (*Notropis rubellus*).