A SURVEY OF THE FISH COMMUNITY

IN THE

LOWER OUACHITA RIVER,

ARKANSAS

Prepared by
the

LOWER OUACHITA RIVER WORK GROUP

Compiled
by

James Wise

and

Steve Filipek, John Giese,
Bill Keith, and Don Turman

Arkansas Game and Fish Commission
Arkansas Department of Pollution Control and Ecology

JANUARY 1993
WQ93-01-1

Table of Contents

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENTS

This report would have not been possible if not for the countless hours of field work performed by the following personnel:

Arkansas Game and Fish Commission:

Steve Filipek, Don Turman, John Stark, Craig Uyeda, Mark Shaw, Brian Wagner, Brett Hobbs, Stuart Wooldridge, Pat Fitts, Jerry Smith

Arkansas Department of Pollution Control and Ecology:

Bill Keith, John Giese, James Wise, Nat Nehus, Rusty McAllister,

Arkansas Soil and Water Conservation Commission:

Tammy Avery

United States Fish and Wildlife

Robert Ellis

Ouachita Baptist University:

Dr. Tim Knight

Private Consultant

Dr. Forest Payne

It is impossible to note every individual who cooperated with and/or who participated in the field activities to make this report possible. Therefore, the author apologizes to those persons whom may have been overlooked in the above list.

INTRODUCTION

A series of stream fishery surveys conducted by Arkansas Game and Fish Commission (AGFC) fisheries biologists from 1987 to 1990 on the lower Ouachita River indicated problems with the river's sport fishery. Estimates of sportfish densities in the main channel of the Ouachita River were compared with similar estimates from a nearby stream, the Saline River. Populations of black bass were almost fifty percent less, sunfish populations were sixty percent less, and catfish populations were even less abundant in 1990 in the Ouachita River than in the Saline River. Because of the numerous anthropogenic impacts to the Ouachita River, traditional fisheries management efforts were not deemed adequate to improve the river's fisheries. Therefore, in late 1990, a committee was formed to ascertain possible causes for the impacted aquatic biota and to work towards the river's enhancement. This committee was called the Lower Ouachita River Work Group and consisted of personnel from six state agencies, three federal agencies, a state university representative, and a private consultant. After the group reviewed the river's existing historical data, a scope of work was developed to help define the problems of the Ouachita River, their magnitude, and hopefully find their source(s) for future ameliorative work.

One part of the analysis was evaluating the river's fisheries. During the summer and fall of 1991 and 1992, the Arkansas Game and Fish Commission (AGFC) and the Arkansas Department of Pollution Control and Ecology (PC&E), in conjunction with the Lower Ouachita

River Work Group (LORWG), initiated a fish community survey of the lower Ouachita River. Eight collecting segments (Reaches) were identified on the lower Ouachita River from just below Remmel Dam in Hot Spring County, to the Arkansas/Louisiana State line. In 1991, there was one collecting station in each designated reach of the river, except Reach #7, the Felsenthal Reservoir. Two stations were located in Reach #6. After analysis of the 1991 data, it was decided that additional sampling was needed. In 1992, samples were collected from each of the 1991 stations except the Reach #2 station. Also, two new stations were added, one each in Reach #2 and one in Reach #5. At each station, fishes were collected by several different methods to obtain a representative sample of the fish community.

The objectives of this survey were: 1) to determine the fish community structure in each designated reach, 2) to determine if the fish community is impaired, 3) to obtain fish flesh samples for contaminant analysis, and 4) to determine the needs for any future collections.

The purpose of this report is to summarize the results of the fish community survey from the summer and fall of 1991 and 1992.

Description of Survey Area

The Ouachita River arises in the Ouachita Mountains Ecoregion near Mena, Arkansas, and flows almost due east through three impoundments, Lakes Ouachita, Hamilton, and Catherine, before entering the Gulf Coastal Plains Ecoregion near Malvern, Arkansas (ADPC&E 1987). The river bottom below Lake Catherine lies within the Alluvium Formation of gravel, sand, silt, and clay, with additional formations consisting of sands, gravel, clays, silts, and some paleozoic rock along the Alluvium's border (Hosman 1982).

In Reach #1 (Remmel Dam to Rockport, approximately seven river miles) the river has a relatively steep gradient, 3 to 5 ft/mi, with a moderate to swift current and flows out of the Ouachita Mountains Ecoregion and across the "Fall Line"[1]. The bedrock bottom is covered by loose gravel or large to medium sized boulders. Light penetration usually extends the depth of the water column.

The river flows southwest along the "Fall Line" in Reach #2 (Rockport to the Caddo River, approximately 23 river miles). The gradient is less, 3 to 3.5 ft/mi. The bottom consists of gravel, a few medium sized rocks, and little bedrock. The water is clear, moderately flowing, with little sedimentation occurring.

In Reach #3 (the Caddo River to the Little Missouri River, approximately 51 river miles) the river turns more southeasterly again and the gradient decreases to approximately 1 ft/mi. Riffle

[1]The "Fall Line" stretches from Northeast to Southwest Arkansas, along which the topography changes from the Arkansas Delta to the Interior Highlands.

bottoms are gravel, pool bottoms are fine gravel to sand, and there is little to no bedrock present. The velocity has decreased, sedimentation increased, and the river is taking on characteristics of a larger river system. There are some shallow areas in the middle of the river forming deep riffles. Light penetration has decreased, and turbidity is noticeably higher.

Significant changes can be seen in the river's morphology in Reach #4 (Little Missouri River to Camden, approximately 26 river miles). The gradient has decreased to less than 1 ft/mi. The bottom becomes mostly sand, with some gravel-to-sand in the few riffle areas. Light penetration is one to two feet, turbidity and sedimentation has increased, and the velocity has decreased.

Reaches #5 and #6 (approximately 100 river miles, Camden to the Felsenthal Pool) are morphologically similar, but are distinctively different from the upstream reaches. The stream gradient is less than 0.5 ft/mi, no riffles are present, the bottom is sand/silt, and light penetration is usually less than one foot. There are very few shallow areas or sand bars along the steep banks, and a heavy sediment load is evident.

Reach #7, the Felsenthal pool, is a lentic environment and will not be discussed in this report.

Reach #8 (approximately six river miles, Felsenthal Dam to the Ark/La State line) has a stream gradient less than 0.5 ft/mi. The river has a deep channel with steep cut sandy banks and no riffle areas. Light penetration is less than one foot, a heavy sediment load is observable, and the bottom is a shifting sand/silt makeup.

MATERIALS/METHODS

SAMPLING MATERIALS:

Several different sampling gear types were used to meet the objectives of this survey. These included:

1) 2 - boat mounted, electrofishing devices utilizing pulsed D.C. current
2) 1 - backpack electrofisher utilizing pulsed D.C. current
3) 1 - 20' X 6', 3/16" mesh seine
4) 4 - 4' hoop nets (1991 only)
5) 1 - 4' fiddler net (1991 only)

The substrate and water conditions at each location dictated the type of sampling gear used. Therefore, not all gear types listed above were used at each sampling station.

SAMPLING METHODS:

Boat shockers were used at all locations, primarily in the deep pools. The size of the sample area determined the number of boat shockers deployed. The hoop nets and fiddler nets were also used (1991 only) in the deeper areas to obtain additional species which may elude shocking units. The backpack shocker and seine were used along the shorelines, in the shallows, and in the riffles which were inaccessible to the boat shockers. Fish species of all types were collected from all available habitat within the sample area until all available habitat was sampled and a fully representative sample of the species in the area was thought to be obtained. Collections were made only once at each station during the duration of the surveys.

Most large specimens were field identified and released.

Small specimens and those unidentifiable in the field were preserved in a ten percent (10%) formalin solution and returned to the lab at PC&E for identification. The taxonomic keys of Robison and Buchanan (1991), Pflieger (1975), and Douglas (1974) were used in the identifications. A Relative Abundance Value (RAV) for each species collected and/or observed was determined according to Keith (1987). The values are as follows:

1 -- Rare - Species or age group represented by only one or very few individuals in the population; more than likely a remnant, migrant or a displaced species.

1.5 -- Rare to Present

2 -- Present - Species or age group collected with enough frequency to indicate the likely presence of an established population but definitely a subordinate species in the species group.

2.5 -- Present to Common

3 -- Common - Species or age group collected in most areas where such species would exist; individuals frequently seen and apparently well established in the populations; one of the more frequent species of the species group.

3.5 -- Common to Abundant

4 -- Abundant - Species or age group collected easily in a variety of habitats where species expected; numerous individuals seen with consideration of sampling gear limitations and expected abundance of such species; a dominant species of the species group.

For the 1991 survey, the young, sub-adult and adult specimens within each species were ranked together and given one value, resulting in a four point ranking scale. An eight point scale was used in the 1992 survey. The young and sub-adult specimens within each species were ranked together and given one value, and the adult specimens within each species were given a separate value.

STATION LOCATION/DESCRIPTION:

REACH 1 -- STATION - REMMEL DAM

Ouachita River adjacent to Arkansas Highway 270 below Cove Creek. (SECs 29,30, T3S, R17W) Hot Spring County.

DATE OF SAMPLE: July 15, 1991

UNIT OF EFFORT: Boat shocker, 3600 seconds
Backpack shocker, 0.8 km. upstream

DATE OF SAMPLE: [2]July 13, 1992, August 24, 1992, September 14, 1992

UNIT OF EFFORT: Boat shocker, 6700 seconds
Backpack shocker, 6300 seconds w/seine

STREAM CONDITION: Very low flow, clear. Pools and riffles with moderate to large boulders and some aquatic vegetation. Pools also with logs/treetops.

REACH 2 -- STATION A - GRISBY FORD ACCESS

Ouachita River at Grisby Ford Access, approx. 1 mi. E. of I-30, above and below Chatman Creek. (SEC 25, T4S, R18W). Hot Spring County.

DATE OF SAMPLE: August 24, 1992

UNIT OF EFFORT: Boat shocker, 3500 seconds
Backpack shocker, 1230 seconds w/seine

STREAM CONDITION: Low flow, clear. Riffles with moderate to small cobble to gravel, some aquatic vegetation. Pools of gravel to sand bottom with logs/treetops.

REACH 2 -- STATION - HWY 67

Ouachita River at Arkansas Highway 67 bridge, 0.8 km upstream and downstream of the bridge. (SEC 5, T6S, R18W) Hot Spring County.

DATE OF SAMPLE: July 16, 1991

---

[2]This station was located below Remmel Dam, a hydropower structure. We were unable to obtain an adequate sample from our first two visits because of the releases for hydropower generation.

UNIT OF EFFORT: Boat shocker, 4072 seconds
Backpack shocker, 2700 seconds, w/seine

STREAM CONDITION: Low flow, relatively clear. Pools and riffles mainly with gravel bottom. Pools also with logs/treetops.

REACH 3 -- STATION - DALLAS COUNTY ACCESS

Ouachita River at the Dallas County Access, approximately 1.6 km upstream and downstream. (SECs 31,36, T9S, R17-18W) Dallas County.

DATE OF SAMPLE: JULY 17, 1991

UNIT OF EFFORT: 2 boat shockers, 7200 seconds
backpack shocker

DATE OF SAMPLE: August 26, 1992

UNIT OF EFFORT: Boat shocker, 2043 seconds
Backpack shocker, 2200 seconds w/seine

STREAM CONDITION: Water level low but with a substantial flow. Pools primarily with logs/treetops and roots. Riffles primarily with gravel bottom.

REACH 4 -- STATION A - TATE'S BLUFF

Ouachita River at Tate's Bluff Access, downstream of the Little Missouri River confluence. (SEC 1, R18W, SEC 6, R17W, T11S) Ouachita County.

DATE OF SAMPLE: August 24, 1992

UNIT OF EFFORT: 2 Boat shockers, 3600 seconds
Backpack shocker, 1200 seconds w/seine

STREAM CONDITION: Moderate flow with shallow shoal over gravel substrate. Pools with logs/treetops and sandy to gravel bottom.

REACH 4 -- STATION - CAMDEN

Ouachita river 2.4 km. to 4.8 km. above Arkansas Highway 7 bridge. (SECs 10,11,14,15, T13N, R17W) Ouachita County.

DATE OF SAMPLE: July 18, 1991

UNIT OF EFFORT: Boat shocker, 4375 seconds
Backpack shocker

DATE OF SAMPLE: July 13, 1992

UNIT OF EFFORT: 2 Boat shockers, 4160 seconds
Backpack shocker, 1300 seconds w/seine

STREAM CONDITION: Moderate flow, 1-2 foot visibility. Pools mainly with logs/treetops, gravel bottom, rootwads, and undercut banks. Riffles primarily with gravel bottom.

REACH 5 -- STATION - WEST TWO BAYOU

Ouachita River just below the confluence of West Two Bayou. (SECs 5,8,9, T14S, R16W) Ouachita county.

DATE OF SAMPLE: July 30, 1991

UNIT OF EFFORT: 2 boat shockers
Backpack shocker
20′ X 6′ seine
3-3 1/2" gill nets

DATE OF SAMPLE: July 14, 1992

UNIT OF EFFORT: 2 boat shockers, 2889 seconds
Backpack shocker, 1700 seconds w/seine

STREAM CONDITION: Water six feet high and rising, 1 foot visibility. Pools primarily with logs/treetops. Some roots and terrestrial vegetation. No obvious riffle area.

REACH 6 -- STATION A - SMACKOVER

Ouachita River downstream from Smackover Creek. (SECs 4,5, T16S, R14W) Union County.

DATE OF SAMPLE: August 2, 1991

UNIT OF EFFORT: 2 boat shockers
20′ X 6′ seine
1-3 1/2" gill net
3-4′ hoop nets

DATE OF SAMPLE: July 17, 1992

UNIT OF EFFORT: 2 boat shockers 4850 seconds
backpack shocker 2178 seconds
15-20 seine hauls

STREAM CONDITION: Flooded into some terrestrial vegetation, 1 foot visibility. Pools primarily with logs/treetops. Some terrestrial vegetation. No obvious riffle area.

REACH 6 -- STATION B - PIGEON HILL ACCESS

Ouachita River downstream of the Pigeon Hill Access. (SECs 29,30, T16S, R12W) Union County.

DATE OF SAMPLE: July 31, 1991

UNIT OF EFFORT: 2 boat shockers
20' X 6' seine
2-3 1/2" gill nets
2-4' hoop nets

DATE OF SAMPLE: August 25, 1992

UNIT OF EFFORT: Boat shocker, 4222 seconds
Backpack shocker, 802 seconds

STREAM CONDITION: Water level 1 to 1.5 feet high, 1 foot visibility. Pools primarily with logs/treetops. Some terrestrial vegetation and roots. No riffle area.

REACH 8 -- STATION - COFFEE CREEK

Ouachita River below Felsenthal Lock and Dam, and below confluence of Coffee Creek. (SECs 30,31, T19S, R9W) Union County.

DATE OF SAMPLE: August 1, 1991

UNIT OF EFFORT: 2 boat shockers
1-20' X 6' seine
4-4' hoop nets
1-4' fiddler net

DATE OF SAMPLE: August 25, 1992

UNIT OF EFFORT: 2 boat shockers, 3754 seconds
Backpack shocker 576 seconds w/seine
5 to 10 seine hauls

STREAM CONDITION: Water level 1 foot high, 1 foot visibility. Pools primarily with logs/treetops. Some terrestrial vegetation and roots. No riffle area.

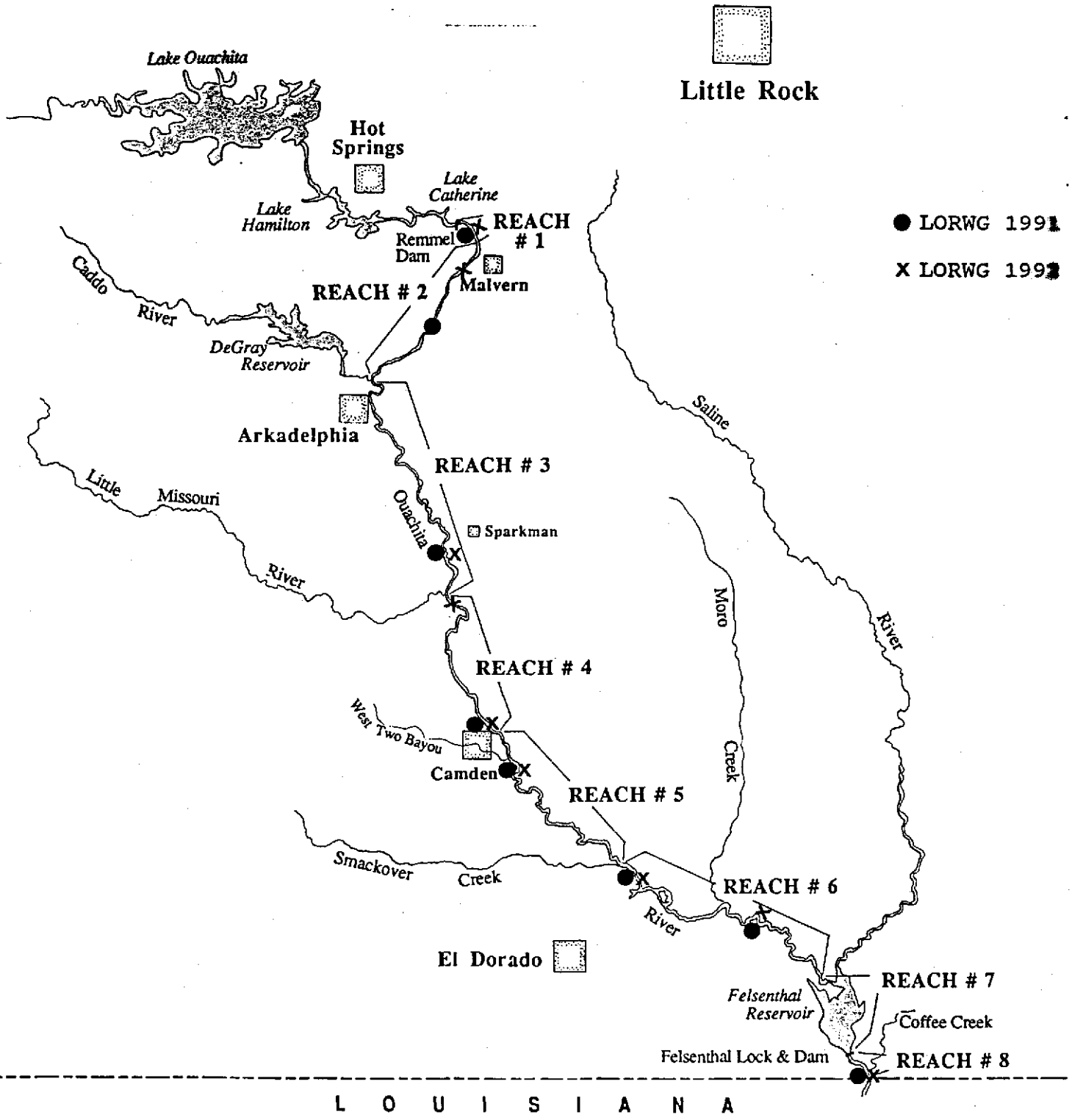
RESULTS - 1991 COLLECTIONS

Eight collecting stations, one within each designated reach of the lower Ouachita River except Reach #7 (Felsenthal Reservoir), and two within Reach #6 (#6A and #6B), are identified in Figure 1. The two stations within Reach #6 will be referred to as Reach #6A, and Reach #6B. Table 1 describes the limits of each of the eight reaches. A single collection was made at each station during the summer and fall of 1991. The materials and methods used at each sampling station are described in the station/description section above.

A total of seventy-nine species, representing thirty-eight genera, and sixteen families were collected during the survey. Table 2 gives a list of these species, outlined by family, and includes the common name of each species. Also found in Table 2 is the Relative Abundance Value (RAV) assigned to each species and the total number of species collected at each station. A four point ranking system was used. There were 32, 44, 52, 40, 27, 28, 27, and 22 species collected from the stations in Reaches 1, 2, 3, 4, 5, 6A, 6B, and 8, respectively (Figure 2).

The cyprinids were the most diverse group. Eighteen species were collected throughout the survey area. However, only six species consistently appeared at three or more locations, with nine species only appearing at a single location. Only one Cyprinid, Cyprinus carpio, the common carp, was reported from the Reach #1 station. The Reach #3 station hosted the most diverse and abundant community of cyprinids with 11 species collected.

FIGURE 1



Ouachita River Eight (8) Reaches
LORWG Station Locations

TABLE 1

Limits for Each River Reach

Reach	Location
#1	Remmel Dam to Rockport
#2	Rockport to confluence with Caddo River
#3	Confluence with Caddo to confluence with Little Missouri River
#4	Confluence with Little Missouri to Camden, Arkansas
#5	Camden, Arkansas, to confluence with Smackover Creek
#6	Confluence with Smackover Creek to upper end of Felsenthal Reservoir
#7	Felsenthal Reservoir
#8	Felsenthal dam to Louisiana line

TABLE 2

LOWER OUACHITA RIVER WORK GROUP (1991)

RELATIVE ABUNDANCE VALUES

FISH FAMILY AND SPECIES		REACH 1	REACH 2	REACH 3	REACH 4	REACH 5	REACH 6A	REACH 6B	REACH 8
Lepisosteidae	Gars								
Lepisosteus oculatus	Spotted gar	-	3.0	4.0	3.0	3.0	2.0	4.0	3.0
Lepisosteus osseus	Longnose gar	3.0	2.0	2.0	2.0	-	-	2.0	2.5
Amiidae	Bowfins								
Amia calva	Bowfin	-	1.5	-	-	-	-	-	-
Anguillidae	Eels								
Anguilla rostrata	American eel	3.0	3.0	3.0	2.0	2.0	-	-	-
Clupeidae	Herrings								
Dorosoma cepedianum	Gizzard shad	3.0	3.0	4.0	4.0	4.0	3.5	4.0	3.0
Dorosoma petenense	Threadfin shad	-	-	-	-	2.0	2.0	-	2.0
Esocidae	Pikes								
Esox americanus	Grass pickerel	-	-	-	2.0	-	-	-	-
Esox niger	Chain pickerel	-	1.5	-	-	-	2.0	2.5	2.0
Cyprinidae	Minnows								
Campostoma anomalum	Stoneroller	-	4.0	4.0	4.0	2.0	2.0	-	-
Cyprinella venustus	Blacktail shiner	-	2.0	2.5	1.0	3.5	2.5	4.0	3.0
Cyprinella whipplei	Steelcolor shiner	-	-	2.5	3.0	2.5	3.0	-	-
Cyprinus carpio	Carp	2.0	2.5	-	3.0	3.0	2.5	2.5	2.5
Erimystax x-punctatus	Gravel chub	-	-	2.0	-	-	-	-	-
Hybognathus hayi	Cypress minnow	-	3.0	-	-	-	2.0	3.0	-
Hybognathus nuchalis	Silvery minnow	-	3.0	4.0	4.0	2.0	3.0	3.0	2.5
Hybopsis amnis	Pallid shiner	-	-	2.0	-	-	-	-	-
Lythrurus fumeus	Ribbon shiner	-	-	-	-	-	-	2.0	-
Lythrurus umbratilis	Redfin shiner	-	2.0	-	-	-	-	-	-
Notemigonus chrysoleucas	Golden shiner	-	-	-	-	-	-	-	2.0
Notropis atherinoides	Emerald shiner	-	-	2.0	3.0	-	-	-	-
Notropis boops	Bigeye shiner	-	4.0	4.0	-	-	-	-	-
Notropis texanus	Weed shiner	-	1.5	-	2.0	-	-	-	-
Notropis volucellus	Mimic shiner	-	-	1.0	-	-	-	-	-
Opsopoeodus emiliae	Pugnose minnow	-	-	-	1.0	-	-	-	-
Pimephales notatus	Bluntnose minnow	-	-	2.0	-	-	-	-	-
Pimephales vigilax	Bullhead minnow	-	-	4.0	-	-	-	-	-
Catostomidae	Suckers								
Hypentelium nigricans	Northern hogsucker	-	2.0	2.0	1.0	-	-	-	-
Ictiobus bubalus	Smallmouth buffalo	-	-	2.0	2.0	2.0	-	2.0	-
Ictiobus cyprinellus	Bigmouth buffalo	-	3.0	1.0	2.0	3.0	-	-	3.0
Minytrema melanops	Spotted sucker	4.0	2.0	-	2.0	-	2.0	2.0	-
Moxostoma carinatum	River redhorse	2.0	-	3.0	2.0	-	-	-	-
Moxostoma erythrurum	Golden redhorse	4.0	3.0	2.0	4.0	2.5	2.0	-	-
Moxostoma poecilurum	Blacktail redhorse	-	-	2.0	2.0	2.5	-	-	-
Ictaluridae	Catfishes								
Ameiurus natalis	Yellow bullhead	-	-	1.0	-	-	-	-	-
Ictalurus furcatus	Blue catfish	-	-	-	-	2.0	-	2.0	-
Ictalurus punctatus	Channel catfish	2.0	2.0	4.0	2.0	2.0	2.0	2.0	2.0
Noturus eleutherus	Mountain madtom	-	-	2.5	-	-	-	-	-
Noturus miurus	Brindled madtom	-	-	1.0	-	-	-	-	-
Noturus nocturnus	Freckled madtom	1.0	-	2.5	-	-	-	-	-
Polydictus olivaris	Flathead catfish	-	2.0	2.0	2.0	-	-	2.0	2.0

TABLE 2 (cont)

LOWER OUACHITA RIVER WORK GROUP (1991)

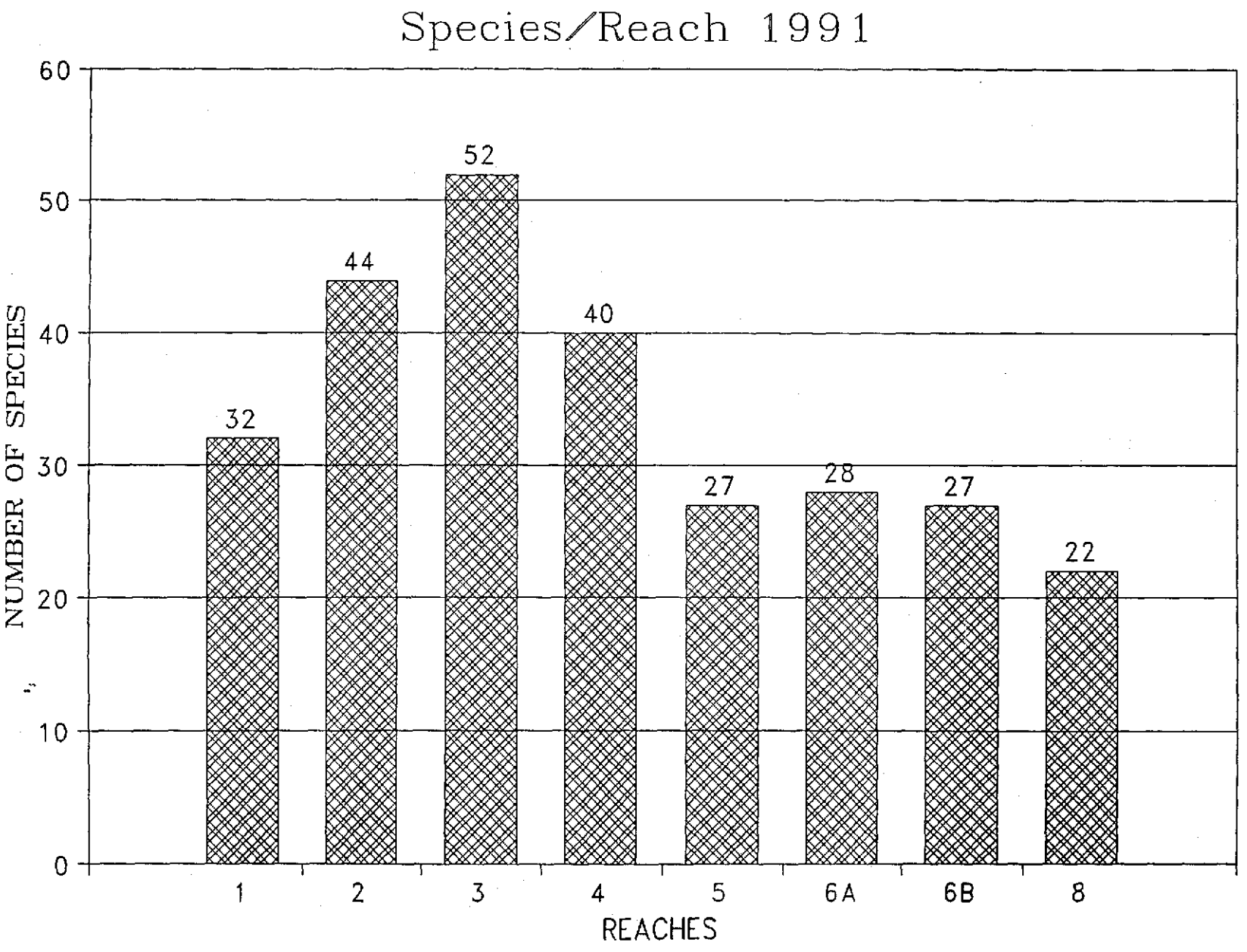
RELATIVE ABUNDANCE VALUES

FISH FAMILY AND SPECIES		REACH 1	REACH 2	REACH 3	REACH 4	REACH 5	REACH 6A	REACH 6B	REACH 8
Cyprinodontidae	Killifishes								
Fundulus catenatus	Northern studfish	-	2.0	1.0	-	-	-	-	-
Fundulus notatus	Blackstripe topminnow	1.0	-	-	2.5	-	-	-	3.0
Fundulus olivaceus	Blackspotted topminnow	2.0	2.0	1.0	2.5	2.0	3.0	3.5	-
Poeciliidae	Livebearers								
Gambusia affinis	Mosquitofish	-	2.0	2.0	2.0	-	2.5	-	-
Aphredoderidae	Pirate perch								
Aphredoderus sayanus	Pirate perch	-	-	2.0	2.0	-	-	-	-
Atherinidae	Silversides								
Labidesthes sicculus	Brook silverside	2.0	2.0	2.0	2.0	2.5	2.0	3.0	2.0
Percichthyidae	Temperate bass								
Morone chrysops	White bass	-	-	-	-	-	-	-	2.0
Centrarchidae	Sunfishes								
Ambloplites ariommus	Shadow bass	2.0	2.0	-	-	-	-	-	-
Elassoma zonatum	Banded pigmy sunfish	-	-	2.0	-	-	-	-	-
Lepomis cyanellus	Green sunfish	2.5	2.0	1.0	-	-	-	-	-
Lepomis gulosus	Warmouth sunfish	2.0	1.0	-	-	-	2.0	2.0	-
Lepomis humilis	Orangespotted sunfish	-	-	-	-	-	2.0	-	-
Lepomis macrochirus	Bluegill	3.0	2.0	2.0	3.0	2.0	3.0	3.0	1.5
Lepomis megalotis	Longear sunfish	4.0	3.0	2.0	3.0	4.0	3.0	3.0	3.0
Lepomis microlophus	Redear sunfish	-	2.0	1.0	2.0	3.0	2.0	2.0	3.0
Lepomis punctatus	Spotted sunfish	1.0	-	1.0	1.5	2.0	-	-	2.0
Micropterus dolomieui	Smallmouth bass	2.0	-	-	-	-	-	-	-
Micropterus punctulatus	Spotted bass	2.5	2.5	2.0	3.0	2.5	2.5	3.0	-
Micropterus salmoides	Largemouth bass	2.5	2.0	2.0	2.5	3.0	2.5	3.0	-
Pomoxis annularis	White crappie	2.0	2.0	-	2.0	2.0	2.0	2.5	2.5
Pomoxis nigromaculatus	Black crappie	-	-	2.0	2.0	3.0	2.0	2.5	3.5
Percidae	Perches								
Crystallaria asprella	Crystal darter	-	2.0	1.0	1.0	-	-	1.0	-
Etheostoma blennioides	Greenside darter	2.0	3.0	-	-	-	-	-	-
Etheostoma collettei	Creole darter	-	2.0	-	-	-	-	-	-
Etheostoma gracile	Slough darter	-	-	1.0	-	-	-	-	-
Etheostoma histrio	Harlequin darter	-	2.5	3.0	2.0	-	-	-	-
Etheostoma radiosum	Orangebelly darter	2.5	2.0	3.0	-	-	-	-	-
Etheostoma spectabile	Orangethroat darter	2.0	-	-	-	-	-	-	-
Etheostoma stigmaeum	Speckled darter	1.0	-	-	-	-	-	-	-
Etheostoma vivax	Scaly sand darter	-	-	2.0	-	-	2.0	2.0	-
Etheostoma zonale	Banded darter	3.5	3.0	2.0	-	-	-	-	-
Percina caprodes	Logperch	3.0	2.0	2.5	3.0	2.0	2.5	-	-
Percina copelandi	Channel darter	2.5	-	-	-	-	-	-	-
Percina maculata	Blackside darter	-	-	1.0	-	-	-	-	-
Percina sp.	Thompson darter	1.0	1.0	-	-	-	-	-	-
Percina sciera	Dusky darter	-	-	1.0	2.0	-	-	-	-
Percina uranidae	Stargazing darter	2.0	1.0	-	-	-	-	-	-
Stizostedion vitreum	Walleye	2.5	2.0	1.0	-	-	-	-	-
Sciaenidae	Drums								
Aplodinotus grunniens	Freshwater drum	-	2.0	2.0	2.0	3.0	2.5	2.0	2.0
	TOTAL SPECIES	32	44	52	40	27	28	27	22
	TOTAL RELATIVE ABUNDANCE	74.5	99.0	110.5	93.0	69.0	65.0	69.5	56.0

16 FAMILIES
39 GENERA
79 SPECIES

Note: RAV's based on a four point scale.

FIGURE 2


Species/Reach 1991
NUMBER OF SPECIES
60
50
40
30
20
10
0
32
44
52
40
27
28
27
22
1
2
3
4
5
6A
6B
8
REACHES

The genus Pimephales, represented in the LORWG survey by two species, was collected only at the Reach #3 station, but these species were given RAV rankings of "present" and "abundant". The lower four Reaches, #5, #6A, #6B, and #8, had only six or fewer species of cyprinids represented within their communities. The RAV rankings of each of the species were usually "present" or "common". The number of cyprinid species reported from each reach is illustrated in Figure 3, Cyprinidae.

There were 14 centrarchid species collected throughout the survey area. Ambloplites ariommus, the shadow bass, and Micropterus dolomieui, the smallmouth bass, were only reported from the upper two reaches. Lepomis cyanellus, the green sunfish, was reported from Reaches #1, #2, and #3, only. Lepomis humilis, the orangespotted sunfish, and Elassoma zonatum, the banded pygmy sunfish, were each reported from only one reach, #1, and #3, respectively. The other ten centrarchids were relatively common throughout the survey area with eight or more species being reported from all reaches except Reach #8, only six centrarchid species reported. Figure 3, Centrarchidae, illustrates the number of centrarchid species collected in each reach.

Seven species of catostomids were reported throughout the survey area. There were only three species of catostomids reported from Reach #1. Reach #4 hosted all seven species while only one catostomid species, Ictiobus cyprinellus, the bigmouth buffalo, was reported from Reach #8. Reaches #6A, and #6B, each had only two species reported, each with a reported RAV ranking of "present".

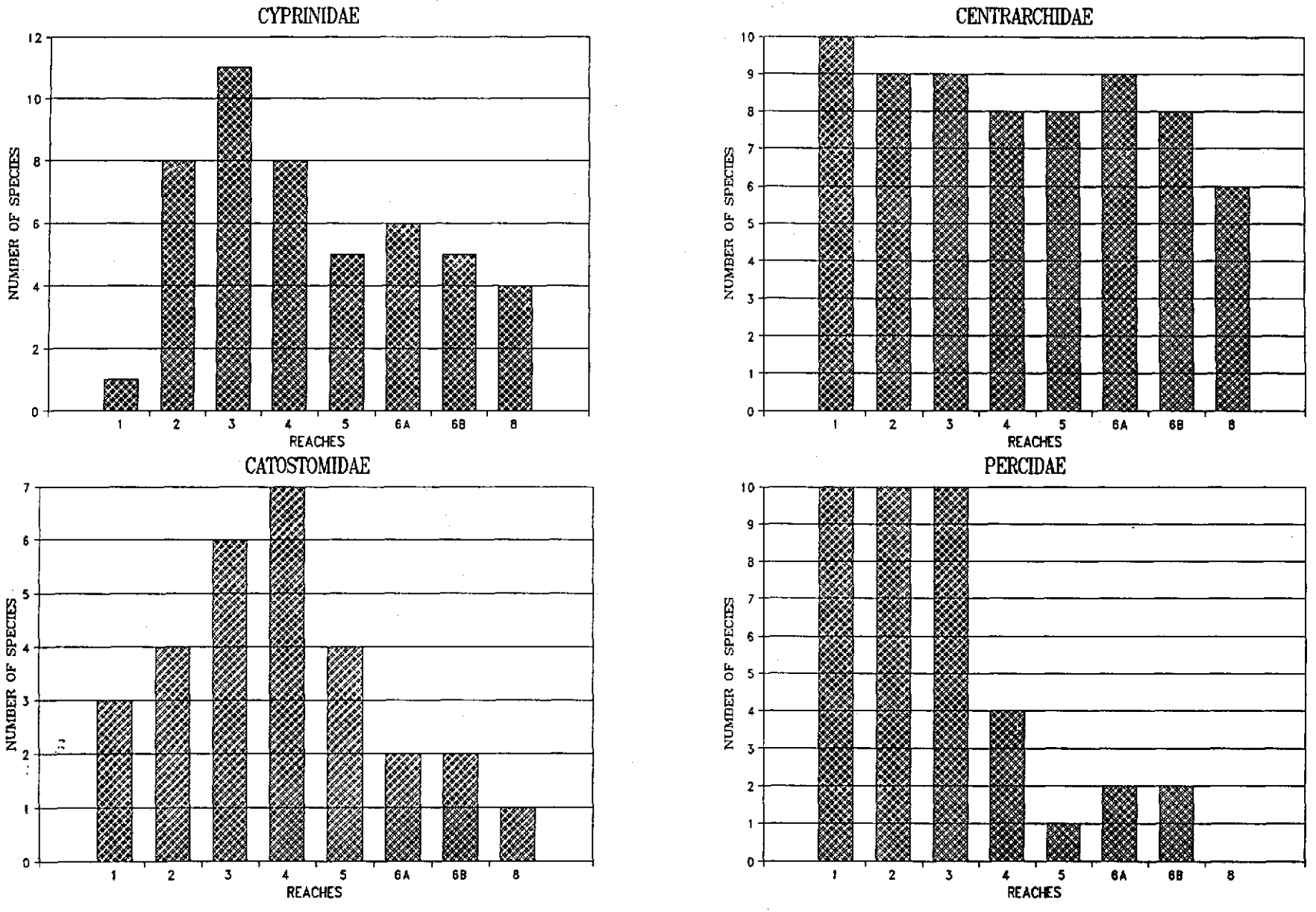


FIGURE 3 -- Number of species by station within selected fish families on the lower Ouachita River, Arkansas (LOWRG 1991).

The number of catostomid species reported from each reach is illustrated in Figure 3, Catostomidae.

There were 17 species of percids reported throughout the survey area. However, there were only seven species that were randomly common to three or more reaches. Percina caprodes, the logperch, was the most frequently collected darter. It was reported from the upper six reaches as "present", "present-to-common", or "common". Stizostedion vitreum, the walleye, was reported from Reaches #1, #2, and #3. These three reaches also each supported ten species of percids which was 20 to 30 percent of the total fish species in those areas (percid species/total species). Three of the four lower reaches, #5, #6A, and #6B, hosted only three species of darters between them, all in low abundances. There were not any Etheostoma species reported from any of the lower four reaches, and no percids of any kind reported from Reach #8. The number of percid species reported from each reach is illustrated in Figure 3, Percidae.

RESULTS - 1992 COLLECTIONS

Nine collecting stations, one within each designated reach of the lower Ouachita River except Reach #7 (Felsenthal Reservoir), and two within Reaches #4 (#4 and #4A) and #6 (#6A and #6B) are identified in Figure 1. A single collection was made at each station during the summer and fall of 1992. The materials and methods used at each station are described in the station/description section above.

A total of eighty-two species, representing thirty-eight

genera, and fifteen families were collected during the survey. Table 3 gives a list of these species, outlined by family, and includes the common name of each species. Also found in Table 3 is the Relative Abundance Values (RAV) assigned to each species and the total number of species collected at each station. Unlike the LORWG 1991 survey, an eight point scoring system was used to determine the RAVs in 1992. There were 39, 43, 43, 35, 26, 32, 29, 24, and 37 species collected from the stations in Reaches 1, 2A, 3, 4A, 4, 5, 6A, 6B, and 8 respectively (Figure 4).

Seventeen species of cyprinids were collected throughout the study area. Nine species appeared at three or more locations, with five species appearing at only single locations. Reach #1 had the poorest diversity of cyprinids with only two species collected, Campostoma anomalum, the stoneroller, and Cyprinella whipplei, the steelcolor shiner. Reach #8 had the most diverse group with ten species, and nine species were collected in Reach #3. Figure 5, Cyprinidae illustrates the number of cyprinid species collected from each reach.

There were twelve species of centrarchids collected throughout the survey area in 1992. Ambloplites ariommus, the shadow bass, was reported at the upper three reaches only, and the green sunfish, Lepomis cyanellus, and the warmouth sunfish, L. gulosus, were reported from Reaches #1, #2, and #6A, only. The other nine centrarchid species were relatively common throughout the survey area. The number of centrarchid species reported from each reach is illustrated in Figure 5, Centrarchidae.

TABLE 3

LOWER OUACHITA RIVER WORK GROUP (1992)

RELATIVE ABUNDANCE VALUES

FISH FAMILY AND SPECIES		REACH 1	REACH 2A	REACH 3	REACH 4A	REACH 4	REACH 5	REACH 6A	REACH 6B	REACH 8
Petromyzontidae	Lampreys									
Ichthyomyzon species	Ammocetes	3.0	-	1.0	-	-	-	-	-	-
Lepisosteidae	Gars									
Lepisosteus oculatus	Spotted gar	1.0	-	3.0	2.0	2.5	5.0	3.0	3.0	4.0
Lepisosteus osseus	Longnose gar	-	-	-	2.0	1.0	-	-	-	2.0
Lepisosteus platostomus	Shortnose gar	-	-	-	-	-	-	-	-	1.0
Anguillidae	Eels									
Anguilla rostrata	American eel	4.0	3.0	1.0	2.0	2.0	-	-	-	-
Clupeidae	Herrings									
Alosa chrysochloris	Skipjack herring	-	-	-	-	-	-	-	-	1.0
Dorosoma cepedianum	Gizzard shad	1.0	2.0	3.0	3.0	7.0	4.0	8.0	8.0	6.0
Dorosoma petenense	Threadfin shad	-	-	-	-	6.0	2.0	-	-	5.0
Esocidae	Pikes									
Esox niger	Chain pickerel	5.0	3.0	-	-	-	-	1.5	3.0	2.0
Cyprinidae	Minnows									
Campostoma anomalum	Stoneroller	4.0	4.0	5.0	6.0	1.0	1.0	-	-	-
Cyprinella venustus	Blacktail shiner	-	1.0	4.0	4.0	4.5	5.0	6.0	3.0	7.0
Cyprinella whipplei	Steelcolor shiner	1.5	1.0	8.0	8.0	4.0	4.0	4.0	3.0	2.5
Cyprinus carpio	Carp	-	4.0	-	2.0	2.0	3.0	3.0	-	6.0
Erimystax x-punctatus	Gravel chub	-	-	5.0	7.0	-	-	-	-	-
Hybognathus nuchalis	Silvery minnow	-	-	1.0	-	7.0	-	6.0	6.0	6.0
Hybopsis amnis	Pallid shiner	-	-	-	-	-	-	-	-	1.0
Lythrurus fumeus	Ribbon shiner	-	-	-	-	-	-	-	1.0	3.0
Lythrurus umbratilis	Redfin shiner	-	5.0	-	-	-	-	-	-	-
Notemigonus chrysoleucas	Golden shiner	-	-	-	-	-	-	1.0	-	-
Notropis atherinoides	Emerald shiner	-	-	2.0	1.0	2.0	2.5	2.0	8.0	8.0
Notropis boops	Bigeye shiner	-	3.0	4.0	4.0	-	-	-	-	-
Notropis texanus	Weed shiner	-	-	-	-	-	-	1.0	-	5.0
Notropis volucellus	Mimic shiner	-	-	-	-	-	-	-	-	2.0
Opsopoeodus emiliae	Pugnose minnow	-	1.0	-	-	-	-	-	-	-
Pimephales notatus	Bluntnose minnow	-	3.0	4.0	-	-	-	-	-	6.0
Pimephales vigilax	Bullhead minnow	-	-	4.0	4.0	2.0	4.5	-	1.0	-
Catostomidae	Suckers									
Carpiodes carpio	River carpsucker	-	-	-	2.0	-	-	-	-	-
Carpiodes cyprinus	Quillback carpsucker	-	-	-	-	2.0	-	-	-	-
Hypentelium nigricans	Northern hogsucker	-	6.0	6.0	4.0	-	1.5	-	-	-
Ictiobus bubalus	Smallmouth buffalo	-	-	-	-	-	-	-	1.0	-
Ictiobus cyprinellus	Bigmouth buffalo	-	2.0	-	-	-	2.5	-	-	4.0
Ictiobus niger	Black buffalo	-	-	1.0	-	-	-	-	-	-
Minytrema melanops	Spotted sucker	4.0	1.0	1.0	-	3.0	2.0	2.0	2.0	-
Moxostoma carinatum	River redhorse	2.0	-	2.0	4.0	-	-	-	-	-
Moxostoma erythrurum	Golden redhorse	4.0	5.0	6.0	6.0	2.5	2.0	2.0	-	-
Moxostoma poecilurum	Blacktail redhorse	-	-	2.0	2.0	4.0	2.0	1.5	-	-
Ictaluridae	Catfishes									
Ameiurus natalis	Yellow bullhead	2.5	-	-	-	-	-	-	-	
Ictalurus furcatus	Blue catfish	-	-	-	-	-	2.0	-	-	2.0
Ictalurus punctatus	Channel catfish	1.0	2.5	3.0	2.0	2.0	2.0	-	2.0	1.0
Noturus eleutherus	Mountain madtom	-	-	2.0	5.0	-	-	-	-	-
Noturus gyrinus	Tadpole madtom	2.0	8.0	-	-	-	-	-	-	-
Noturus miurus	Brindled madtom	-	-	2.0	-	-	-	-	-	-
Noturus nocturnus	Freckled madtom	-	1.0	1.0	-	-	-	-	-	-
Polydictus olivaris	Flathead catfish	-	1.0	2.0	-	-	2.0	-	-	-

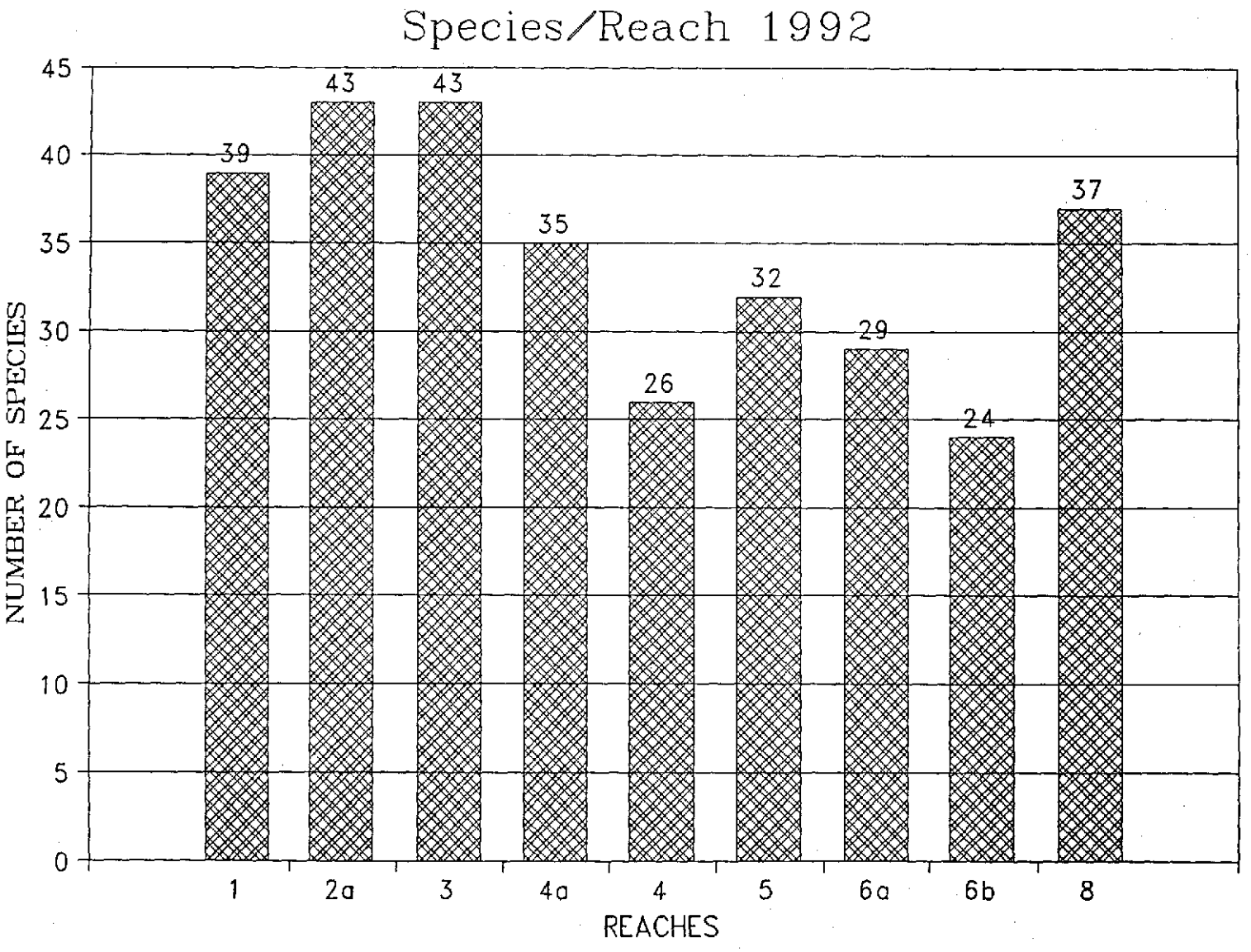
TABLE 3 (cont)

LOWER OUACHITA RIVER WORK GROUP (1992) — RELATIVE ABUNDANCE VALUES

FISH FAMILY AND SPECIES		REACH 1	REACH 2A	REACH 3	REACH 4A	REACH 4	REACH 5	REACH 6A	REACH 6B	REACH 8
Cyprinodontidae	Killifishes									
Fundulus catenatus	Northern studfish	3.0	-	3.0	-	-	-	-	-	-
Fundulus notatus	Blackstripe topminnow	-	-	-	-	-	-	5.0	4.0	6.0
Fundulus olivaceus	Blackspotted topminnow	4.0	3.0	4.0	4.0	2.0	6.0	5.0	4.0	1.0
Poeciliidae	Livebearers									
Gambusia affinis	Mosquitofish	3.0	5.0	-	-	1.0	3.0	1.0	4.0	4.0
Aphredoderidae	Pirate perch									
Aphredoderus sayanus	Pirate perch	-	1.0	1.0	-	-	-	-	-	-
Atherinidae	Silversides									
Labidesthes sicculus	Brook silverside	3.0	6.0	3.0	4.0	-	5.0	8.0	5.0	6.0
Centrarchidae	Sunfishes									
Ambloplites ariommus	Shadow bass	3.0	4.0	1.0	-	-	-	-	-	-
Lepomis cyanellus	Green sunfish	5.0	2.0	-	-	-	-	1.0	-	-
Lepomis gulosus	Warmouth sunfish	4.0	4.0	-	-	-	-	1.0	-	-
Lepomis macrochirus	Bluegill	6.0	5.0	2.0	4.0	4.5	4.5	8.0	7.0	8.0
Lepomis megalotis	Longear sunfish	8.0	8.0	6.0	8.0	5.0	5.5	6.0	4.5	4.0
Lepomis microlophus	Redear sunfish	-	4.0	-	-	-	2.0	1.0	3.0	4.0
Lepomis punctatus	Spotted sunfish	4.0	3.0	-	2.0	-	-	2.0	-	-
Lepomis hybrid	Hybrid sunfish	1.0	-	-	-	-	-	-	-	1.0
Micropterus punctulatus	Spotted bass	5.0	4.0	5.0	7.0	3.5	4.5	4.5	5.3	3.0
Micropterus salmoides	Largemouth bass	6.0	5.0	1.0	4.0	5.0	3.5	6.0	6.0	6.0
Pomoxis annularis	White crappie	1.0	-	-	1.0	-	-	1.0	-	1.0
Pomoxis nigromaculatus	Black crappie	-	2.0	-	3.0	1.0	2.0	-	2.0	3.0
Percidae	Perches									
Etheostoma blennioides	Greenside darter	5.0	8.0	4.0	-	-	-	-	-	-
Etheostoma clara	Western sand darter	-	-	-	-	-	-	-	-	1.0
Etheostoma chlorosomum	Bluntnose darter	3.0	-	-	-	-	-	-	-	4.0
Etheostoma collettei	Creole darter	2.0	1.0	4.0	-	-	1.0	-	-	-
Etheostoma histrio	Harlequin darter	2.0	1.0	5.0	5.0	-	-	-	-	-
Etheostoma nigrum	Johnny darter	-	1.0	-	-	-	-	-	-	-
Etheostoma proeliare	Cypress darter	-	1.0	-	-	-	-	-	-	-
Etheostoma radiosum	Orangebelly darter	6.0	6.0	6.0	1.0	-	-	-	-	-
Etheostoma stigmaeum	Speckled darter	3.0	2.0	2.5	1.0	-	-	-		-
Etheostoma vivax	Scaly sand darter	-	-	-	-	1.0	2.0	-	4.0	4.0
Etheostoma zonale	Banded darter	8.0	8.0	4.0	8.0	-	-	-	-	-
Percina caprodes	Logperch	6.0	-	-	-	-	2.0	2.0	-	1.0
Percina copelandi	Channel darter	4.0	2.0	4.0	2.0	-	5.5	1.0	-	-
Percina maculata	Blackside darter	-	-	-	-	-	1.0	1.0	-	-
Percina sp.	Thompson darter	1.0	-	-	-	-	-	-	-	-
Percina ouachitae	Saddleback darter	-	-	1.0	-	-	-	-	-	-
Percina sciera	Dusky darter	-	-	-	1.0	-	-	-	-	-
Percina uranidae	Stargazing darter	4.0	-	1.0	-	-	-	-	-	-
Stizostedion vitreum	Walleye	2.0	3.0	-	-	-	-	-	-	-
Sciaenidae	Drums									
Aplodinotus grunniens	Freshwater drum	-	-	1.0	2.0	2.0	2.5	-	2.0	2.0
	TOTAL SPECIES	39	43	43	35	26	32	29	24	37
15 FAMILIES	TOTAL RELATIVE ABUNDANCE	134.0	145.5	130.5	126.0	79.5	97.0	94.5	91.5	136.0
38 GENERA										
82 SPECIES										

Note: RAV's based on an eight point scale.

FIGURE 4


Species/Reach 1992
NUMBER OF SPECIES
0
5
10
15
20
25
30
35
40
45
39
43
43
35
26
32
29
24
37
1
2a
3
4a
4
5
6a
6b
8
REACHES

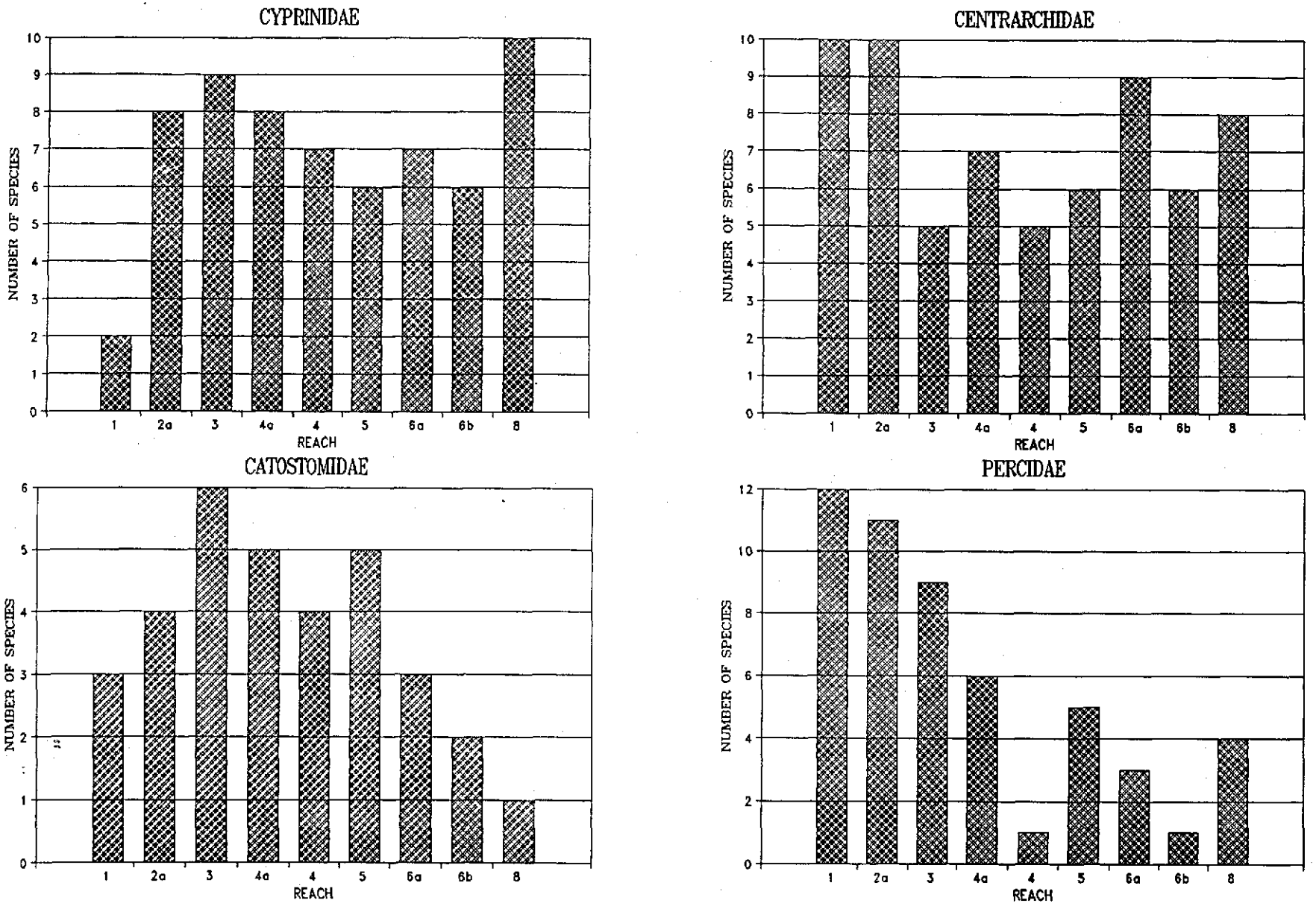


FIGURE 5 -- Number of species by station within selected fish families on the lower Ouachita River, Arkansas (LORWG 1992)

Ten species of catostomids were reported throughout the survey area, however only three species were reported from Reach #1. Reach #3 hosted six species of catostomids while only one species, Ictiobus cyprinellus, the bigmouth buffalo, was reported from Reach #8. Reaches #6A and #6B had only two and three species respectively. The quillback carpsucker, Carpiodes cyprinus, was collected at Reach #4. The number of catostomid species reported from each reach is illustrated in Figure 5, Catostomidae.

The Percidae family was the most diverse group collected during the survey with nineteen species being reported. Nine species were randomly common to three or more reaches. Percina copelandi, the channel darter, was collected from six of the reaches. Six darters were collected at only single locations, and three others appeared at only two locations. Percina sp., the Thompson darter was collected only at Reach #1, and the walleye, Stizostedion vitreum, was reported from only the upper two stations. Only one darter was reported at Reaches #4, and #6B, and Reaches #4, and #8 were the only reaches from the lower five reaches that had any Etheostoma species collected. The number of percids collected from each reach is illustrated in Figure 5, Percidae.

DISCUSSION

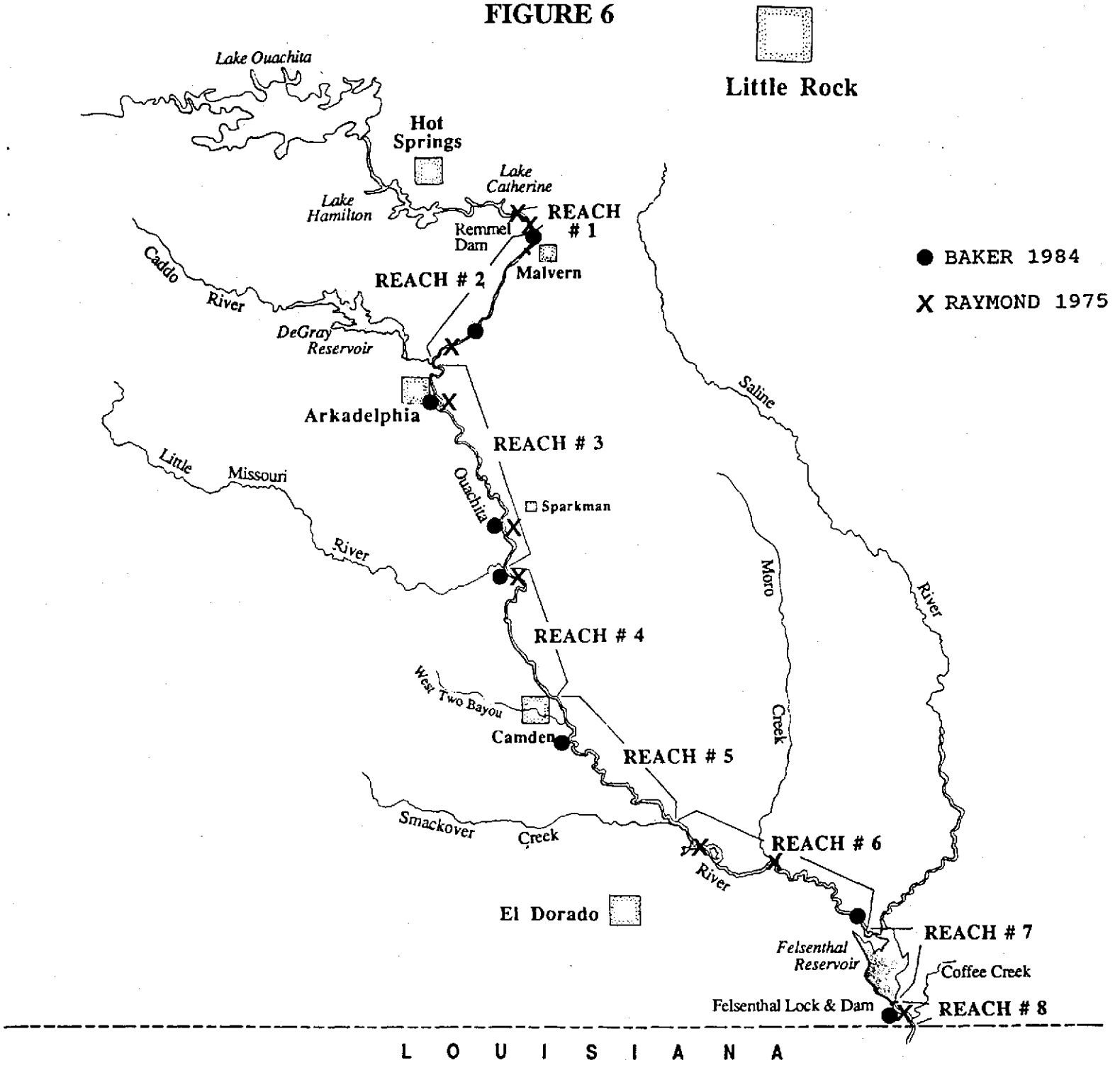
A comparison of the results of the LORWG surveys can be made with the earlier surveys of Baker (1984) and Raymond (1975). The collecting effort at each sampling station was significantly different among the surveys, so direct comparisons of number of

individuals is not appropriate. In addition, the number of species collected may also be influenced by collecting effort. Among the three surveys, sampling stations within a reach are often not at the same locations, and many of the stations of the earlier surveys were sampled more than once. Therefore, the eight reaches of the Ouachita River described above will be used in the comparison. Those sampling stations of Baker's and Raymond's surveys (Figure 6) which fell within the same river reach were combined to better compare the data. This allows the comparison of species trends within and between the surveys. The Felsenthal Reservoir, impounded in the fall of 1984, now occupies most of Reach #7, and was not sampled by the LORWG. The habitats reported by Baker and Raymond from their respective sampling locations in Reach #7 are similar to those reported by the LORWG in Reach #8. Because of this, and the close proximity of these sampling stations to Reach #8, Baker's station #1 and Raymond's station XXIII were compared to the LORWG's station in Reach #8. Table 4 lists the location of sample sites by Baker and Raymond by reaches.

Baker reported collecting sixty-nine species of fish representing thirty-nine genera and sixteen families on the lower Ouachita River (Table 5). He collected fishes from eight sites on the river proper in the summer of 1983 using the following gear types:

1) Boat shocker
2) Backpack shocker
3) 3-150' gill nets
4) 6-3' hoop nets
5) 1/8 in. mesh seines

FIGURE 6



Ouachita River Eight (8) Reaches

TABLE 4

LOCATIONS OF COLLECTION STATIONS

RAYMOND (1975)

REACH	SITE	DESCRIPTION
#1	I	1/2 mi. below Remmel Dam (Sec 36, T3S, R18W).
	III	1/8 mi. N. Hwy. 171 (SEC 16, T4S, R17W).
#2	IV&VI	1 mi. E. US Hwy 67 (SECs 16, 21, T6S, R19W).
#3	VIII	3/4 mi. E. US Hwy 67 (SEC 8, T7S, R19W).
	X	3 mi. W. Hwy 128 (SEC 31, T9S, R17W).
#4	XIII	At the mouth of the Little Missouri River (SEC 1, T11S, R18W).
#5	NONE	
#6	XX	Calion Boat Ramp (SECs 14, 23, T16S, R12W).
#7	XXI	Moro Bay State Park, Hwy 15. (SEC 28, T16S, R12W).
#8	XXIII	US Hwy 82 Bridge (SEC 14, T18S, R10W).

BAKER (1984)

#1	10	1-3 mi. downstream of I-30 Bridge
#2	9	2-3 mi. upstream of US Hwy 67 bridge
#3	7	4 mi. downstream of Arkadelphia
	6	0.5-2 mi. downstream of Dallas County Access
#4	5	below mouth of Little Missouri River
#5	4	5-7 river miles below Camden
#6	NONE	
#7	3	0.5-2 mi upstream of Saline River mouth
#8	1	2 mi. sample area below Saline River

TABLE 5

FISHES COLLECTED BY BAKER (1984)

NUMBER OF SPECIMENS COLLECTED

FISH FAMILY AND SPECIES		REACH 1	REACH 2	REACH 3	REACH 4	REACH 5	REACH 6A	REACH 6B	REACH 8
Polyodontidae	Paddlefishes								
Polyodon spathula	Paddlefish	-	1	1	-	1	-	-	-
Lepisosteidae	Gars								
Atractosteus spatula	Alligator gar	-	-	-	-	-	-	1	-
Lepisosteus oculatus	Spotted gar	1	3	3	1	-	-	12	-
Lepisosteus osseus	Longnose gar	1	3	5	5	1	-	2	4
Lepisosteus platostomus	Shortnose gar	-	-	-	-	-	-	3	-
Amiidae	Bowfins								
Amia calva	Bowfin	-	-	-	-	-	-	1	-
Anguillidae	Eels								
Anguilla rostrata	American eel	2	3	3	3	-	-	-	-
Clupeidae	Herrings								
Alosa chrysochloris	Skipjack herring	1	-	2	1	-	-	2	3
Dorosoma cepedianum	Gizzard shad	24	23	76	6	3	-	38	25
Dorosoma petenense	Threadfin shad	-	-	44	-	118	-	-	-
Hiodontidae	Mooneyes								
Hiodon alosoides	Goldeye	1	-	2	-	-	-	-	-
Hiodon tergisus	Mooneye	-	-	2	-	-	-	-	-
Esocidae	Pikes								
Esox americanus	Grass pickerel	-	-	-	-	1	-	-	-
Esox niger	Chain pickerel	1	-	-	-	-	-	1	-
Cyprinidae	Minnows								
Campostoma anomalum	Stoneroller	3	12	-	-	-	-	-	-
Cyprinella venustus	Blacktail shiner	-	1	24	50	135	-	148	157
Cyprinella whipplei	Steelcolor shiner	3	4	49	20	69	-	2	-
Cyprinus carpio	Carp	20	4	20	3	-	-	3	-
Erimystax x-punctatus	Gravel chub	3	1	2	2	-	-	-	1
Hybognathus nuchalis	Silvery minnow	-	-	-	-	58	-	9	19
Luxilus chrysocephalus	Striped shiner	-	-	-	-	4	-	-	-
Lythrurus fumeus	Ribbon shiner	-	-	-	-	-	-	1	63
Lythrurus umbratilis	Redfin shiner	-	-	-	1	-	-	-	-
Notemigonus chrysoleucas	Golden shiner	-	-	-	-	-	-	-	1
Notropis atherinoides	Emerald shiner	-	1	3	2	11	-	2	45
Notropis boops	Bigeye shiner	274	80	73	20	10	-	1	-
Notropis texanus	Weed shiner	-	-	-	-	-	-	1	57
Opsopoeodus emiliae	Pubnose minnow	-	-	-	-	-	-	-	3
Pimephales notatus	Bluntnose minnow	-	-	1	5	-	-	-	-
Pimephales vigilax	Bullhead minnow	-	-	-	-	-	-	-	5
Catostomidae	Suckers								
Carpiodes carpio	River carpsucker	1	-	-	1	-	-	-	-
Hypentelium nigricans	Northern hogsucker	3	1	2	-	-	-	-	-
Ictiobus bubalus	Smallmouth buffalo	1	5	2	1	1	-	1	-
Ictiobus cyprinellus	Bigmouth buffalo	-	1	1	-	-	-	-	-
Ictiobus niger	Black buffalo	-	-	1	-	-	-	-	-
Minytrema melanops	Spotted sucker	11	-	1	-	-	-	1	-
Moxostoma carinatum	River redhorse	2	10	9	-	-	-	-	-
Moxostoma duquesni	Black redhorse	-	1	1	-	-	-	-	-
Moxostoma erythrurum	Golden redhorse	19	11	28	5	-	-	-	-
Moxostoma poecilurum	Blacktail redhorse	-	-	5	3	-	-	-	-

TABLE 5 (cont)

FISHES COLLECTED BY BAKER (1984)		NUMBER OF SPECIMENS COLLECTED							
FISH FAMILY AND SPECIES		REACH 1	REACH 2	REACH 3	REACH 4	REACH 5	REACH 6A	REACH 6B	REACH 8
Ictaluridae	Catfishes								
Ameiurus natalis	Yellow bullhead	-	-	-	-	1	-	-	-
Ictalurus punctatus	Channel catfish	-	7	7	16	2	-	-	-
Polydictus olivaris	Flathead catfish	1	-	-	-	3	-	1	-
Cyprinodontidae	Killifishes								
Fundulus catenatus	Northern studfish	-	-	2	-	-	-	-	-
Fundulus olivaceus	Blackspotted topminnow	-	1	6	6	1	-	3	3
Poeciliidae	Livebearers								
Gambusia affinis	Mosquitofish	1	-	-	-	9	-	-	-
Atherinidae	Silversides								
Labidesthes sicculus	Brook silverside	11	4	7	14	11	-	53	129
Menidia beryllina	Mississippi silverside	-	-	-	-	2	-	-	-
Centrarchidae	Sunfishes								
Ambloplites ariommus	Shadow bass	-	-	3	-	-	-	-	-
Lepomis gulosus	Warmouth sunfish	-	-	-	-	-	-	1	-
Lepomis macrochirus	Bluegill	2	3	7	3	1	-	22	14
Lepomis megalotis	Longear sunfish	25	12	50	4	1	-	6	7
Lepomis microlophus	Redear sunfish	1	-	-	-	-	-	4	1
Lepomis punctatus	Spotted sunfish	5	-	1	-	-	-	-	-
Micropterus punctulatus	Spotted bass	-	3	11	5	13	-	1	2
Micropterus salmoides	Largemouth bass	2	5	4	3	1	-	9	1
Pomoxis annularis	White crappie	1	-	1	-	1	-	5	6
Pomoxis nigromaculatus	Black crappie	-	-	1	2	1	-	5	6
Percidae	Perches								
Etheostoma chlorosomum	Bluntnose darter	-	-	-	1	-	-	-	-
Etheostoma collettei	Creole darter	1	-	-	-	-	-	-	-
Etheostoma histrio	Harlequin darter	-	-	1	-	-	-	-	-
Etheostoma radiosum	Orangebelly darter	1	5	-	-	-	-	-	-
Etheostoma stigmaeum	Speckled darter	-	-	1	1	-	-	-	-
Etheostoma vivax	Scaly sand darter	-	-	-	3	2	-	3	6
Etheostoma zonale	Banded darter	-	-	4	-	-	-	-	-
Percina caprodes	Logperch	-	-	-	-	-	-	1	-
Percina copelandi	Channel darter	-	3	2	2	-	-	-	-
Stizostedion vitreum	Walleye	-	-	1	-	-	-	-	-
Sciaenidae	Drums								
Aplodinotus grunniens	Freshwater drum	1	2	6	1	-	-	3	2
	TOTAL SPECIES	30	28	30	30	26	-	33	22

16 FAMILIES
39 GENERA
69 SPECIES

Note: Numerals represent the total number of specimens collected.

Approximately one hour of boat shocking was performed at each location and up to six hauls were made with the seine(s) at each location (Baker 1984).

Raymond reported collecting one hundred eleven species of fish representing forty-one genera and twenty families from the lower Ouachita River and its tributaries (Table 6). He made sixty-two collections from twenty-five locations from the summer of 1972 to the summer of 1975 using the following gear types:

1) Electrofishing unit used once
2) 1-100', 2" mesh gill net
3) hoop net-fished two nights
4) 3/16" and 1/4" mesh seines

Only those stations located within the Ouachita River proper are used for comparison in this report. He reports one hundred seven species representing forty-five genera and seventeen families from forty-two collections at ten collecting sites on the river.

A comparison of species collected by Raymond, Baker, and the two LORWG surveys is shown in Table 7. Also, Figure 7 compares the number of species by reach collected in the four surveys.

Reach #1 of the lower Ouachita River (Remmel Dam to Rockport) is effected by the releases from Lake Catherine, impounded by Remmel Dam. This is primarily a "peaking" hydropower structure operated by the Arkansas Power and Light Company (AP&L). However, the greatest influence on this area is from the hydropower dischargers from two other upstream reservoirs. These discharges cause unnatural flow regimes and atypical temperature and dissolved oxygen levels in the Ouachita River for several miles. The sudden releases of high volumes of water also cause scouring and

TABLE 6

FISHES COLLECTED BY RAYMOND (1975)

NUMBER OF SPECIMENS COLLECTED

FISH FAMILY AND SPECIES		REACH 1	REACH 2	REACH 3	REACH 4	REACH 5	REACH 6A	REACH 6B	REACH 8
Petromyzontidae	Lampreys								
Ichthyomyzon castaneus	Chestnut lamprey	1	-	5	-	-	-	-	-
Lepisosteidae	Gars								
Lepisosteus oculatus	Spotted gar	-	-	-	-	-	-	2	-
Lepisosteus osseus	Longnose gar	-	1	3	3	-	1	-	-
Lepisosteus platostomus	Shortnose gar	-	-	1	-	-	-	-	-
Anguillidae	Eels								
Anguilla rostrata	American eel	-	-	-	2	-	-	-	-
Clupeidae	Herrings								
Alosa chrysochloris	Skipjack herring	-	-	1	1	-	-	-	-
Dorosoma cepedianum	Gizzard shad	2	2	8	6	-	14	89	-
Dorosoma petenense	Threadfin shad	2	13	6	51	-	75	294	-
Hiodontidae	Mooneyes								
Hiodon tergisus	Mooneye	-	-	1	1	-	-	-	-
Esocidae	Pikes								
Esox americanus	Grass pickerel	-	-	-	1	-	32	277	8
Esox niger	Chain pickerel	-	-	3	-	-	59	243	25
Cyprinidae	Minnows								
Campostoma anomalum	Stoneroller	17	115	309	296	-	2	9	-
Cyprinella venustus	Blacktail shiner	-	2	86	422	-	438	818	184
Cyprinella whipplei	Steelcolor shiner	32	31	301	1593	-	57	29	8
Cyprinus carpio	Carp	1	-	3	1	-	-	2	-
Erimystax x-punctatus	Gravel chub	-	235	15	1065	-	-	-	-
Hybognathus hayi	Cypress minnow	-	-	-	-	-	142	2458	8
Hybognathus nuchalis	Silvery minnow	-	2	6	31	-	157	562	1
Hybopsis amnis	Pallid shiner	-	-	-	28	-	98	165	12
Lythrurus fumeus	Ribbon shiner	1	-	186	-	-	336	241	4
Lythrurus umbratilis	Redfin shiner	176	2	20	6	-	-	71	-
Luxilus chrysocephalus	Striped shiner	13	2	-	-	-	-	-	-
Macrhybopsis storeriana	Silver chub	-	-	7	-	-	-	-	-
Notemigonus chrysoleucas	Golden shiner	1	-	1	2	-	28	795	11
Notropis atherinoides	Emerald shiner	-	713	811	423	-	98	336	88
Notropis boops	Bigeye shiner	45	225	1447	4585	-	-	6	11
Notropis buchanani	Ghost shiner	-	-	-	-	-	-	13	-
Notropis chalybaeus	Ironcolored shiner	-	-	-	-	-	-	2	-
Notropis maculatus	Taillight shiner	-	-	-	-	-	205	452	132
Notropis perpallidus	Peppered shiner	-	-	-	1	-	-	-	-
Notropis rubellus	Rosyface shiner	-	-	-	19	-	-	-	-
Notropis texanus	Weed shiner	-	-	-	-	-	50	479	89
Notropis volucellus	Mimic shiner	-	-	2	35	-	-	264	3
Opsopoeodus emiliae	Pubnose minnow	-	-	-	16	-	54	402	13
Pimephales notatus	Bluntnose minnow	-	1	28	437	-	3	1	-
Pimephales vigilax	Bullhead minnow	4	-	11	154	-	108	377	490

TABLE 6 (cont)

FISHES COLLECTED BY RAYMOND (1975)		NUMBER OF SPECIMENS COLLECTED							
FISH FAMILY AND SPECIES		REACH 1	REACH 2	REACH 3	REACH 4	REACH 5	REACH 6A	REACH 6B	REACH 8
Catostomidae	Suckers								
Erimyzon oblongus	Creek chubsucker	-	-	-	-	-	-	5	-
Hypentelium nigricans	Northern hogsucker	-	13	37	25	-	-	-	-
Ictiobus cyprinellus	Bigmouth buffalo	-	-	-	-	-	1	-	-
Ictiobus niger	Black buffalo	-	-	3	-	-	-	-	-
Minytrema melanops	Spotted sucker	-	-	-	3	-	-	19	23
Moxostoma carinatum	River redhorse	1	-	1	7	-	-	-	-
Moxostoma duquesni	Black redhorse	-	-	2	-	-	-	-	-
Moxostoma erythrurum	Golden redhorse	-	-	8	115	-	5	4	-
Moxostoma poecilurum	Blacktail redhorse	-	-	5	-	-	1	-	-
Ictaluridae	Catfishes								
Ameiurus melas	Black bullhead	-	-	-	-	-	2	4	40
Ameiurus natalis	Yellow bullhead	-	-	-	-	-	-	16	-
Ictalurus furcatus	Blue catfish	-	-	-	-	-	-	-	4
Ictalurus punctatus	Channel catfish	-	-	2	31	-	-	45	19
Noturus eleutherus	Mountain madtom	-	-	-	16	-	-	-	-
Noturus gyrinus	Tadpole madtom	-	-	-	-	-	-	2	-
Noturus lachneri	Ouachita madtom	1	-	-	-	-	-	-	-
Noturus miurus	Brindled madtom	-	-	5	106	-	-	-	-
Noturus nocturnus	Freckled madtom	-	-	1	1	-	-	-	-
Polydictus olivaris	Flathead catfish	-	-	-	1	-	2	-	-
Cyprinodontidae	Killifishes								
Fundulus catenatus	Northern studfish	-	1	78	2	-	-	-	-
Fundulus chrysotus	Golden topminnow	-	-	-	1	-	11	5	-
Fundulus notatus	Blackstripe topminnow	-	-	-	-	-	30	113	3
Fundulus notti	Starhead topminnow	-	-	-	2	-	24	2	-
Fundulus olivaceus	Blackspotted topminnow	32	6	6	16	-	101	227	20
Poeciliidae	Livebearers								
Gambusia affinis	Mosquitofish	-	18	113	111	-	98	1688	423
Aphredoderidae	Pirate perch								
Aphredoderus sayanus	Pirate perch	-	-	-	8	-	-	26	45
Atherinidae	Silversides								
Labidesthes sicculus	Brook silverside	125	24	36	351	-	905	752	153
Percichthyidae	Temperate bass								
Morone chrysops	White bass	-	-	1	2	-	1	14	6
Morone mississippiensis	Yellow bass	-	-	-	-	-	-	1	-
Morone saxatilis	Striped bass	-	-	1	-	-	-	-	-
Centrarchidae	Sunfishes								
*Ambloplites rupestris	Rock bass	-	-	2	5	-	-	-	-
Centrarchus macropterus	Flier	-	-	1	1	-	1	60	3
Elassoma zonatum	Banded pigmy sunfish	-	5	-	1	-	8	8	1
Lepomis cyanellus	Green sunfish	3	-	21	-	-	12	6	-
Lepomis gulosus	Warmouth sunfish	-	-	1	3	-	26	132	26
Lepomis humilis	Orangespotted sunfish	-	-	5	-	-	15	8	10
Lepomis macrochirus	Bluegill	21	-	16	28	-	246	796	81
Lepomis marginatus	Dollar sunfish	-	-	-	-	-	46	129	1
Lepomis megalotis	Longear sunfish	66	46	178	534	-	34	28	62
Lepomis microlophus	Redear sunfish	-	-	3	1	-	43	19	15
Lepomis punctatus	Spotted sunfish	-	-	-	-	-	1	3	10
Lepomis symmetricus	Bantam sunfish	-	-	-	-	-	31	5	4

TABLE 6 (cont)

FISHES COLLECTED BY RAYMOND (1975)		NUMBER OF SPECIMENS COLLECTED							
FISH FAMILY AND SPECIES		REACH 1	REACH 2	REACH 3	REACH 4	REACH 5	REACH 6A	REACH 6B	REACH 8
Centrarchidae (cont)									
Micropterus dolomieui	Smallmouth bass	-	1	-	4	-	-	-	-
Micropterus punctulatus	Spotted bass	-	6	42	46	-	48	25	4
Micropterus salmoides	Largemouth bass	4	1	4	8	-	14	62	53
Pomoxis annularis	White crappie	-	-	-	-	-	3	5	-
Pomoxis nigromaculatus	Black crappie	-	-	-	2	-	2	136	6
Percidae	Perches								
Crystallaria asprella	Crystal darter	-	1	1	13	-	-	-	-
Etheostoma asprigene	Mud darter	-	2	1	2	-	4	160	-
Etheostoma blennioides	Greenside darter	9	13	34	9	-	-	-	-
Etheostoma chlorosomum	Bluntnost darter	-	-	2	9	-	50	171	435
Etheostoma collettei	Creole darter	20	-	7	10	-	-	3	2
Etheostoma gracile	Slough darter	-	-	-	-	-	8	7	-
Etheostoma histrio	Harlequin darter	-	21	4	11	-	-	-	-
Etheostoma nigrum	Johnny darter	-	1	-	-	-	-	-	-
Etheostoma proeliare	Cypress darter	-	-	-	-	-	8	37	1
Etheostoma radiosum	Orangebelly darter	67	13	24	16	-	-	-	-
Etheostoma stigmaeum	Speckled darter	-	1	25	95	-	-	-	-
Etheostoma vivax	Scaly sand darter	-	-	1	16	-	-	10	-
Etheostoma whipplei	Redfin darter	-	1	-	34	-	-	-	-
Etheostoma zonale	Banded darter	-	26	62	158	-	-	-	-
Percina caprodes	Logperch	-	2	4	21	-	83	40	383
Percina copelandi	Channel darter	-	25	148	575	-	2	8	11
Percina maculata	Blackside darter	-	-	-	2	-	3	7	1
Percina ouachitae	Saddleback darter	-	-	-	3	-	1	15	-
Percina sciera	Dusky darter	-	-	-	8	-	-	2	-
Percina shumardi	River darter	-	-	-	-	-	2	8	4
Percina uranidae	Stargazing darter	-	-	22	5	-	-	-	-
Stizostedion vitreum	Walleye	-	-	2	9	-	-	3	-
Sciaenidae	Drums								
Aplodinotus grunniens	Freshwater drum	-	-	-	4	-	1	6	-
	TOTAL SPECIES	24	34	62	71	-	57	72	48

16 FAMILIES
45 GENERA
107 SPECIES

Note: Numerals represent the total number of specimens collected.
* See footnote No. 3.

TABLE 7

LOWER OUACHITA RIVER SPECIES COMPARISON LIST

FISH FAMILY AND SPECIES		RAYMOND 1975	BAKER 1984	LORWG 1991	LORWG 1992
Petromyzontidae	Lampreys				
Ichthyomyzon castaneus	Chestnut lamprey	X			
Polyodontidae	Paddlefishes				
Polyodon spathula	Paddlefish		X		
Lepisosteidae	Gars				
Atractosteus spatula	Alligator gar	X			
Lepisosteus oculatus	Spotted gar	X	X	X	X
Lepisosteus osseus	Longnose gar	X	X	X	X
Lepisosteus platostomus	Shortnose gar		X		X
Amiidae	Bowfins				
Amia calva	Bowfin		X	X	
Anguillidae	Eels				
Anguilla rostrata	American eel	X	X	X	X
Clupeidae	Herrings				
Alosa chrysochloris	Skipjack herring	X	X		X
Dorosoma cepedianum	Gizzard shad	X	X	X	X
Dorosoma petenense	Threadfin shad	X	X	X	X
Hiodontidae	Mooneyes				
Hiodon alosoides	Goldeye		X		
Hiodon tergisus	Mooneye	X	X		
Esocidae	Pikes				
Esox americanus	Grass pickerel	X	X	X	
Esox niger	Chain pickerel	X	X	X	X
Cyprinidae	Minnows				
Campostoma anomalum	Stoneroller	X	X	X	X
Cyprinella venustus	Blacktail shiner	X	X	X	X
Cyprinella whipplei	Steelcolor shiner	X	X	X	X
Cyprinus carpio	Carp	X	X	X	X
Erimystax x-punctatus	Gravel chub	X	X	X	X
Hybognathus hayi	Cypress minnow	X		X	
Hybognathus nuchalis	Silvery minnow	X	X	X	X
Hybopsis amnis	Pallid shiner				X
Luxilus chrysocephalus	Striped shiner	X	X		
Lythrurus fumeus	Ribbon shiner	X	X	X	X
Lythrurus umbratilis	Redfin shiner	X	X	X	X
Macrhybopsis storeriana	Silver chub	X			
Notemigonus crysoleucas	Golden shiner	X	X	X	X
Notropis atherinoides	Emerald shiner	X	X	X	X
Notropis boops	Bigeye shiner	X	X	X	X
Notropis buchanani	Ghost shiner	X	X	X	X
Notropis chalybaeus	Ironcolored shiner	X			
Notropis maculatus	Taillight shiner	X			
Notropis perpallidus	Peppered shiner	X			
Notropis rubellus	Rosyface shiner	X			
Notropis texanus	Weed shiner	X	X	X	X
Notropis volucellus	Mimic shiner	X		X	X
Opsopoeodus emiliae	Pugnose minnow	X	X	X	X
Pimephales notatus	Bluntnose minnow	X	X	X	X
Pimephales vigilax	Bullhead minnow	X	X	X	X
Cyprinodontidae	Killifishes				
Fundulus catenatus	Northern studfish	X	X	X	X
Fundulus chrysotus	Golden topminnow	X			
Fundulus notatus	Blackstripe topminnow	X		X	X
Fundulus notti	Starhead topminnow	X			
Fundulus olivaceus	Blackspotted topminnow	X	X	X	X
Poeciliidae	Livebearers				
Gambusia affinis	Mosquitofish	X	X	X	X
Aphredoderidae	Pirate perch				
Aphredoderus sayanus	Pirate perch	X	X	X	X
Atherinidae	Silversides				
Labidesthes sicculus	Brook silverside	X	X	X	X
Menidia beryllina	Mississippi silverside		X		
Percichthyidae	Temperate bass				
Morone chrysops	White bass	X		X	
Morone mississippiensis	Yellow bass	X			
Morone saxatilis	Striped bass	X			
Centrarchidae	Sunfishes				
Ambloplites ariommus	Shadow bass	X	X	X	X
Centrarchus macropterus	Flier	X			
Elassoma zonatum	Banded pigmy sunfish	X		X	
Lepomis cyanellus	Green sunfish	X		X	X
Lepomis gulosus	Warmouth sunfish	X	X	X	X
Lepomis humilis	Orangespotted sunfish	X		X	
Lepomis macrochirus	Bluegill	X	X	X	X
Lepomis marginatus	Dollar sunfish	X			
Lepomis megalotis	Longear sunfish	X	X	X	X
Lepomis microlophus	Redear sunfish	X	X	X	X
Lepomis punctatus	Spotted sunfish	X	X	X	X
Lepomis symmetricus	Bantam sunfish	X			
Micropterus dolomieui	Smallmouth bass	X		X	X
Micropterus punctulatus	Spotted bass	X	X	X	X
Micropterus salmoides	Largemouth bass	X	X	X	X
Pomoxis annularis	White crappie	X	X	X	X
Pomoxis nigromaculatus	Black crappie	X	X	X	X

TABLE 7

LOWER OUACHITA RIVER SPECIES COMPARISON LIST

FISH FAMILY AND SPECIES		RAYMOND 1975	BAKER 1984	LORWG 1991	LORWG 1992
Catostomidae	Suckers				
Carpiodes carpio	River carpsucker		X		X
Carpiodes cyprinus	Quillback carpsucker				X
Erimyzon oblongus	Creek chubsucker	X			
Hypentelium nigricans	Northern hogsucker	X	X	X	X
Ictiobus bubalus	Smallmouth buffalo		X	X	X
Ictiobus cyprinellus	Bigmouth buffalo	X	X	X	X
Ictiobus niger	Black buffalo	X	X		X
Minytrema melanops	Spotted sucker	X	X	X	X
Moxostoma carinatum	River redhorse	X	X	X	X
Moxostoma duquesnei	Black redhorse	X	X		
Moxostoma erythrurum	Golden redhorse	X	X	X	X
Moxostoma poecilurum	Blacktail redhorse	X	X	X	X
Ictaluridae	Freshwater catfishes				
Ameiurus melas	Black bullhead	X			
Ameiurus natalis	Yellow bullhead	X	X	X	X
Ictalurus furcatus	Blue catfish	X		X	X
Ictalurus punctatus	Channel catfish	X		X	X
Noturus eleutherus	Mountain madtom	X		X	X
Noturus gyrinus	Tadpole madtom	X			X
Noturus lachneri	Ouachita madtom	X			
Noturus miurus	Brindled madtom	X		X	X
Noturus nocturnus	Freckled madtom	X		X	X
Polydictus olivaris	Flathead catfish	X	X	X	X
Percidae	Perches				
Crystallaria asprella	Crystal darter	X		X	
Etheostoma asprigene	Mud darter	X			
Etheostoma blennioides	Greenside darter	X		X	X
Etheostoma clara	Western sand darter				X
Etheostoma chlorosomum	Bluntnose darter	X	X		X
Etheostoma collettei	Creole darter	X	X	X	X
Etheostoma fusiforme	Swamp darter	X			
Etheostoma gracile	Slough darter	X			
Etheostoma histrio	Harlequin darter	X	X	X	X
Etheostoma nigrum	Johnny darter	X			X
Etheostoma proeliare	Cypress darter	X			X
Etheostoma radiosum	Orangebelly darter	X	X	X	X
Etheostoma spectabile	Orangethroat darter			X	
Etheostoma stigmaeum	Speckled darter	X	X	X	X
Etheostoma vivax	Scaly sand darter	X	X	X	X
Etheostoma whipplei	Redfin darter	X			
Etheostoma zonale	Banded darter	X	X	X	X
Percina caprodes	Logperch	X	X	X	X
Percina copelandi	Channel darter	X	X	X	X
Percina maculata	Blackside darter	X		X	X
Percina sp.	Thompson darter			X	X
Percina ouachitae	Saddleback darter	X			X
Percina sciera	Dusky darter	X		X	X
Percina shumardi	River darter	X			
Percina uranidae	Stargazing darter	X		X	X
Stizostedion vitreum	Walleye	X	X	X	X
Sciaenidae	Drums				
Aplodinotus grunniens	Freshwater drum	X	X	X	X
	TOTAL SPECIES	107	68	79	81

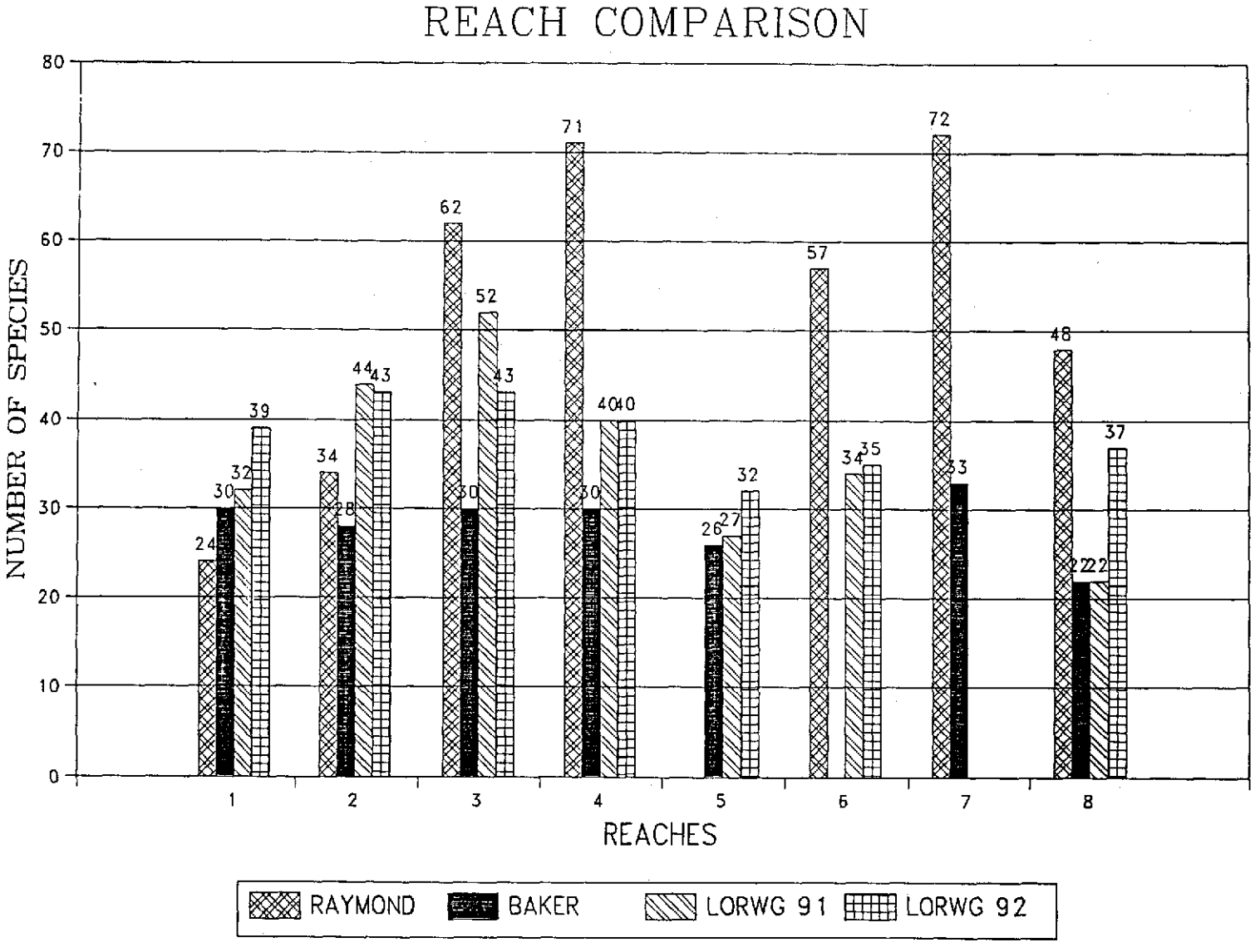


FIGURE 7 -- Total species collected by reach between the four surveys.

displacement of tailwater substrate, thus decreasing macroinvertebrate habitat, which is important to the trophic relationships in a riverine environment. Temperature profiles of four to seven degrees celsius less than normal have been observed as far down river as Arkadelphia (US COE 1985). The hypolimnetic discharge from Lake Ouachita, an impoundment approximately 18 river miles upstream of Lake Catherine, greatly influence the characteristics of the Lake Catherine releases (US COE 1985). These unnatural characteristics are reflected in the fish community of Reach #1.

The cyprinid community in Reach #1 was represented by only one species in the LORWG (1991) survey, and two species in 1992. Surveys by Baker and Raymond collected five and nine species of cyprinids, respectively, within this reach. By comparing the cyprinid community of Reaches #1, #2, and #3, between each of the surveys, a definite trend of increasing species in a downstream direction can be seen (Figure 8). However, in the river's upper reaches we would expect to find a much greater diversity and abundance of cyprinids. It is also noted that a possible trend of decreasing cyprinids over time may exist at the upstream locations.

Normally, a fish community within a riverine environment will increase in both diversity and abundance in a downstream direction. The lower Ouachita River cyprinids do not exhibit this trend. The cyprinid diversity peaks in Reaches #3, and #4, in the three surveys (except Reach #7 in Raymond), then either levels off or declines in Reaches #5 thru #8 (Figures 3, 5, 9, and 10, Cyprinidae).

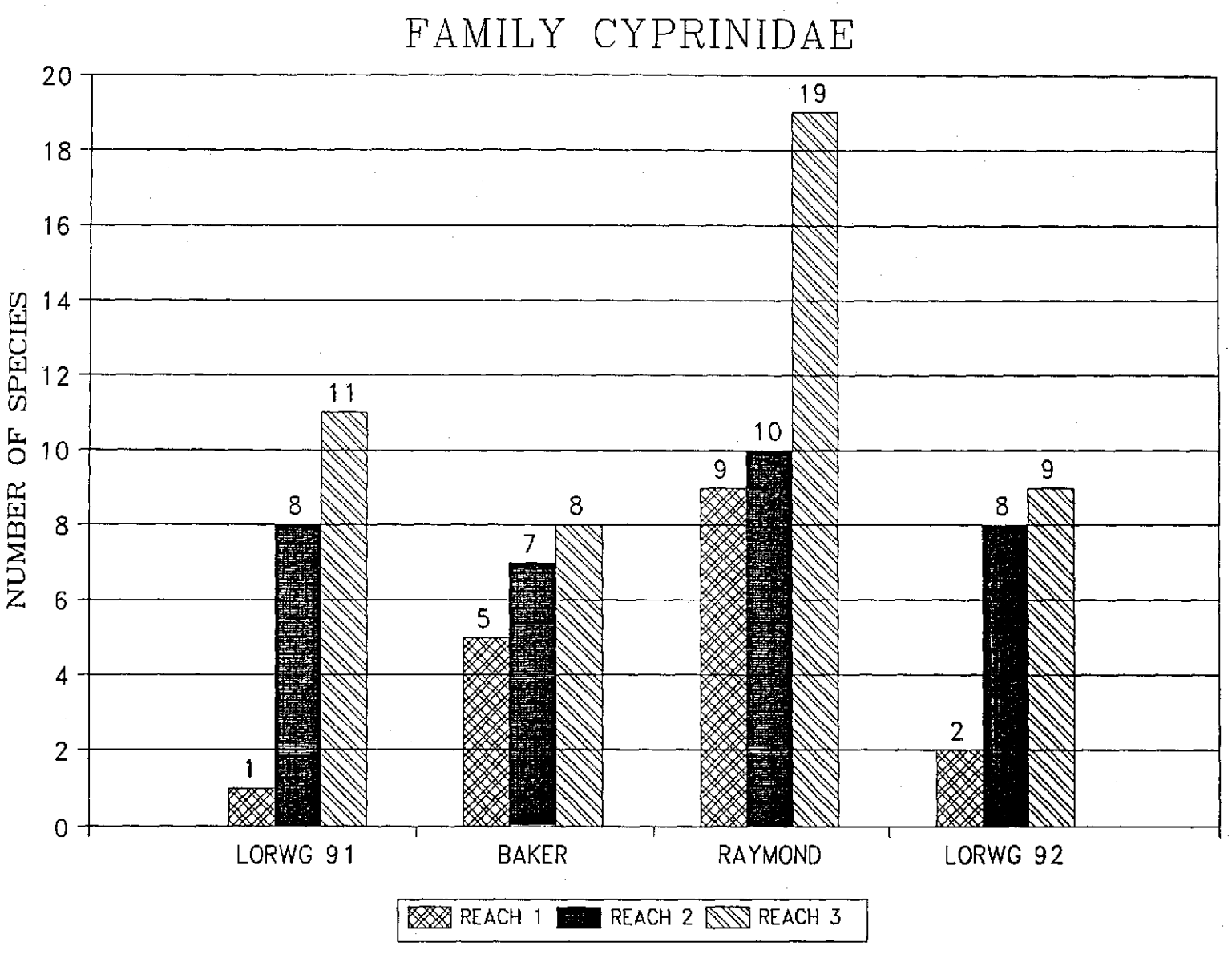


FIGURE 8 -- The number of cyprinid species collected from the lower Ouachita River from reaches #1, #2, and #3, between the four sampling events.

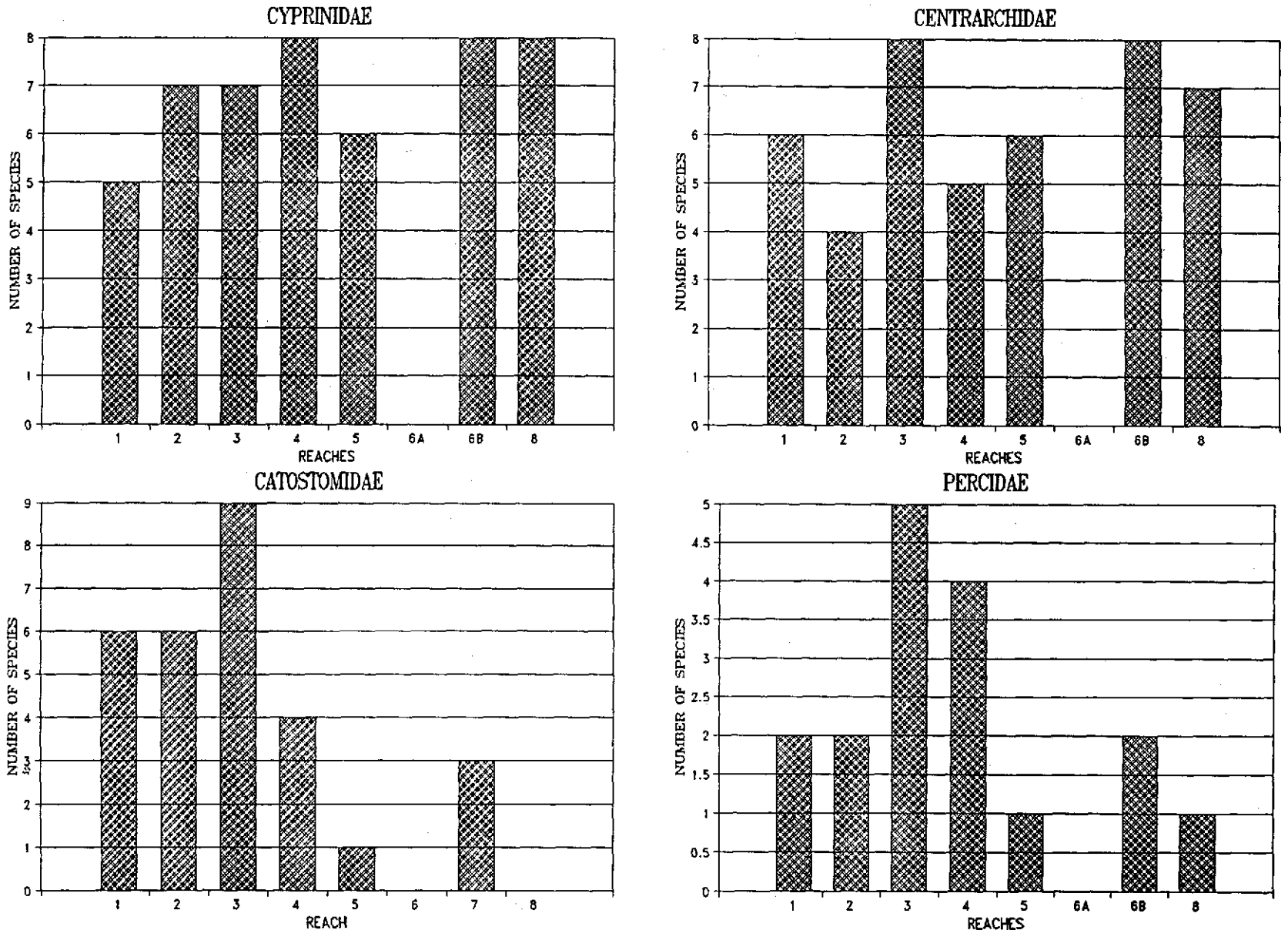


FIGURE 9 -- Number of species by station within selected fish families on the lower Ouachita River, Arkansas (Baker 1984).

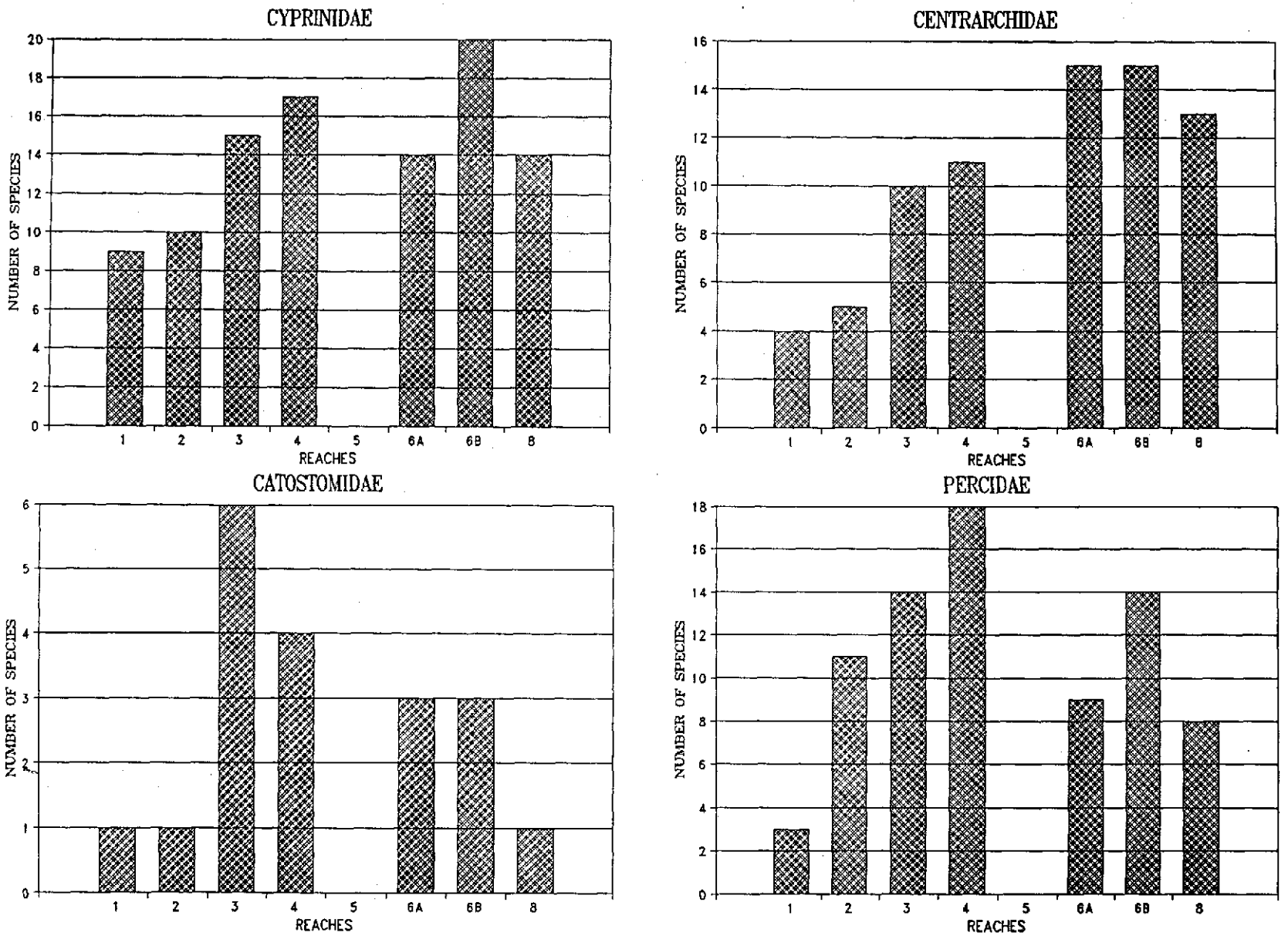


FIGURE 10 -- Number of species by station within selected fish families on the lower Ouachita River, Arkansas (Raymond 1975).

This is most noticeable in Reaches #5 and #8, which demonstrate significant decreases in total number of species and specimens collected, except in the LORWG 1992 sampling. This could be related to water quality, limited habitat, or the ineffectual sampling of all habitat types. However, since this trend has appeared in three separate surveys, the later is unlikely. Some discrepancies could be related to differences in the sampling efforts among the surveys within each reach.

The Catostomidae family distribution throughout the river is quite similar to that of the Cyprinidae family. There is a increase in both the total number of species and specimens sampled from Reaches #1 thru #3 in the Raymond and Baker surveys and from Reaches #1 thru #4 in both LORWG surveys. A drastic decrease begins in the middle river reaches and continues throughout the lower portion (Figures 3, 5, 9, and 10, Catostomidae). No more than three species, all of which were in low abundances, were reported from any one of the lower three reaches among the surveys. This is not what one would expect to find in a healthy riverine environment.

Catostomids are basically bottom dwelling fishes which use their sucker-like mouths to suck food materials from the bottom sediments. Most species feed upon burrowing insects and small mollusks (Pflieger, 1975). Therefore, any impairment of the benthic community by the releases from Lake Catherine would limit the catostomid population in the upper reaches. Similarly, deposition of heavy silt or toxic silt loads in the river's lower

reaches would embed and suffocate or be toxic to benthic organisms and would impair the development of the catostomid population. Also, channel dredging operations contribute to the sediment load in the river and at the same time greatly disturb the benthic community.

The LORWG (1992) reported collecting two sub-adult specimens of the quillback carpsucker, Carpiodes cyprinus, In Reach #4. Robison, 1991, reports that this species has only been reported from the river on one previous occasion. This most recent record now helps to varify the validity of the first record, and also helps to confirm the existence of a quillback carpsucker population in the river.

The family Centrarchidae was represented by 14 species in the LORWG 1991 survey and a total of 17 species between the three surveys (Table 7). Baker reported only a minimal change in the centrarchid population throughout the survey area. However, a downstream decrease in species of centrarchids occurred during both LORWG surveys. There were 10 species reported in Reach #1, with an decreasing downstream trend to Reach #8 (Figure 3, 5, 9, and 10, Centrarchidae).

The smallmouth bass and the shadow bass were reported in only the upper three reaches during this survey. These two species require clear, cool water, usually with some kind of flow most of the year, and are intolerant of severe habitat changes and high turbidity (Robison 1991). All of these required conditions are found in the tail waters of Lake Catherine, clear, cool, low

turbidity water with some sort of continuous flow. Severe habitat changes do occur with generation and is probably why these two species were limited in abundance within these reaches.

Raymond reports a definite downstream increase in both species and total abundances of the centrarchids within the survey area (Figure 10, Centrarchidae). The upper four reaches contained 4 to 11 species, while the lower three reaches were represented by 13 to 15 species. The shadow bass[3] and the smallmouth bass were the only two common centrarchids absent from the lower three reaches. The warmer water temperatures of the lower reaches probably limits the downstream migration of these two species.

All three surveys demonstrated similar trends in the Percidae family. Twenty-five species of percids were reported between the three surveys. Raymond reported many species that were not reported by either Baker nor the LORWG (Table 7). Several of these are species which primarily inhabit the river's backwaters where Baker and the LORWG did not sample. Raymond and Baker both reported an increase in the number of species and total abundances from Reach #1 to #4, and then a sharp decline throughout the lower reaches (Figures 9, and 10, Percidae). The LORWG reported equal numbers of species and abundances from the first three reaches with a sharp decline through the last five reaches (Figure 3, Percidae). Most percids prefer the swifter-flowing, less turbid streams

[3]Raymond (1975) identified specimens of rock bass as Ambloplites ruprestris, which was the correct identification at that time. Since then, the rock bass genus has been split into several species with those occurring in the Ouachita River as being Ambloplites ariommus, the shadow bass (Cashner, 1977).

characteristic of the headwaters of major rivers (Pflieger, 1975). Therefore, we would expect to see a decline in percid species in a downstream direction of major rivers. However, the decline shown in the LORWG data appears excessive.

There are some percid species which prefer the larger river environments, e.g. Crystallaria asprella, the crystal darter, Percina shumardi, the river darter, and P. copelandi, the channel darter. These species, however, are unable to adapt to large amounts of turbidity (Pflieger 1975). All of these species are endemic to the Ouachita River watershed in Arkansas and would be expected to be located in the river's lower reaches in at least moderate abundances. During the surveys of Baker and LORWG (1991), the crystal darter, scaly sand darter, and logperch were the only species reported below Reach #5 and were in low abundances. This sharp decline in abundance and diversity could be the result of altered water quality, excessive siltation, the destruction of habitat, or inefficient sampling. Much more work must be completed before a definite conclusion can be made on this point.

An important sportfish of the Percid family, the walleye, is usually found in fairly deep pools, prefers cooler water temperatures and is not very tolerant of turbidity (Robison 1991). Walleye were only taken in the upper three reaches during the LORWG surveys and had decreasing values of abundances in a downstream direction. This is understandable since both the water temperature and the turbidity increase in a downstream direction.

SUMMARY

There appears to be two sections of the lower Ouachita River where the fish communities are being negatively impacted in some fashion. Reaches #1, and #2, Remmel Dam to the Caddo River, seem to be strongly influenced by discharges from Remmel Dam and above. The fluctuation in water levels, depressed summer water temperatures, erratic dissolved oxygen levels and the disturbance of the benthic habitat in these reaches tends to place excessive stress on the fish communities. There may also be other impacts associated with the hypolimnetic discharges, such as the redox activities of trace metals and/or other compounds. Additionally, upstream point source discharges and nonpoint source run-off from strip mining activities are suspect.

In the lower reaches of the river, particularly below Reach #4, fish community impairments are also indicated. The causes may be hydrology related too, but the apparent spatial fluctuations in the fish community indicate point source impacts, either single source or cumulative, particularly near West Two Bayou and Smackover Creek. Although not apparent from the current data, heavy siltation from nonpoint sources and dredging for navigation channel maintenance may also be causing adverse impacts.

REFERENCES

Arkansas Department of Pollution Control and Ecology, 1987. Physical, Chemical and Biological Characteristics of Least-Disturbed Reference Streams in Arkansas' Ecoregions. Volume II - Data Analysis.

Baker, John A. 1984. Fish Studies of the Caddo, Little Missouri, and Ouachita Rivers, Ouachita River Basin, Arkansas. Aquatic Habitat Group. Environmental Laboratory Waterways Experiment Station.

Cashner, Robert C., and Suttkus, Royal D. July 1977. Ambloplites constellatus, a New Species of Rock Bass from the Ozark Uplands of Arkansas and Missouri, with a Review of Western Rock Bass Populations. The American Midland Naturalist. Vol 98, No. 1, pp 147-161. University of Notre Dame Press.Notre Dame, Indiana.

Douglas, Neil H., PhD. 1974. Freshwater Fishes of Louisiana. Claitor's Publishing Division. Baton Rouge, Louisiana, 70821.

Hosman, R. L. 1982. Outcropping Tertiary Units in Southern Arkansas: U.S. Geological Survey. Map I-1405.

Keith, William E. 1987. Distribution of Fishes in Reference Streams Within Arkansas' Ecoregions. Proceedings from the Arkansas Academy of Science, Vol 41.

Lee, David S., et. al. 1980. Atlas of North American Freshwater Fishes. North Carolina State Museum of Natural History.

Ouachita Baptist University, Department of Chemistry, 1985. Arkansas Lakes Interim Study. Final Report. Volume I. Department of the Army.

Pflieger, William L. 1975. The Fishes of Missouri. Missouri Department of Conservation.

Raymond, Larry Ray. 1975. Fishes of the Hill Province Section of the Ouachita River, From Remmel Dam to the Arkansas-Louisiana Line. Unpublished Masters Thesis. Northeast Louisiana University. Monroe, Louisiana.

Robison, Henry W. and Buchanan, Thomas M. 1991. Fishes of Arkansas. The University of Arkansas Press. Fayetteville, Arkansas 72701