THE FISHES OF PIASA CREEK, WEST CENTRAL ILLINOIS

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ABSTRACT. — A survey of the fishes of Piasa Creek, in Jersey, Madison and Macoupin counties, west central Illinois, included 41 collections from 31 sites totaling 23,475 specimens of 44 species. The fauna consists of: 1) river and large water species found only in the lower portions of the drainage, 2) ubiquitous small stream species of the area, 3) isolated populations of *Chrosomus erythrogaster* and *Cottus carolinae* in the upper reaches of Mill Creek.

Piasa Creek and its four tributaries drain approximately 150 square miles in Macoupin, Jersey and Madison counties in west central Illinois, and is the only major tributary entering the Mississippi River from Illinois between the mouths of the Missouri River and the Illinois River. The mouth of Piasa Creek is 14 miles north of the mouth of the Missouri River and 9 miles south of the Illinois River. Piasa Creek proper flows essentially north-south with the upper portion of the drainage forming a dendritic drainage pattern in soft Pennsylvanian sandstones and shales (Figure 1). The lower portion of the creek is on more resistant Mississippian limestones and a trellis drainage is developed following joint lines parallel to the strike of the Lincoln anticline. Approximately one mile upstream from the mouth, Mill Creek joins the main creek from the west, and four miles further upstream Rocky Fork joins from the east. These two tributaries flow through the Mississippian limestones and thus typically have rock and gravel bottoms. The upper two tributaries are both called "Little Piasa Creek." The lower joins from the east approximately eight miles above the mouth and the upper from the west two miles further upstream. The upper main creek and the upper reaches of these two tributaries flow through sandstones and shales and typically have sand and mud bottoms.

Piasa Creek was not included in the localities cited by Forbes and Richardson (1908) but is of considerable interest because of its unique location. During this study, 41 collections were made at 31 sites and a total of 23,475 specimens representing 44 species were taken. Of particular interest is the discovery of isolated populations of the southern redbelly dace, *Chrosomus erythrogaster*, and the banded sculpin, *Cottus carolinae*, in the upper reaches of Mill Creek.

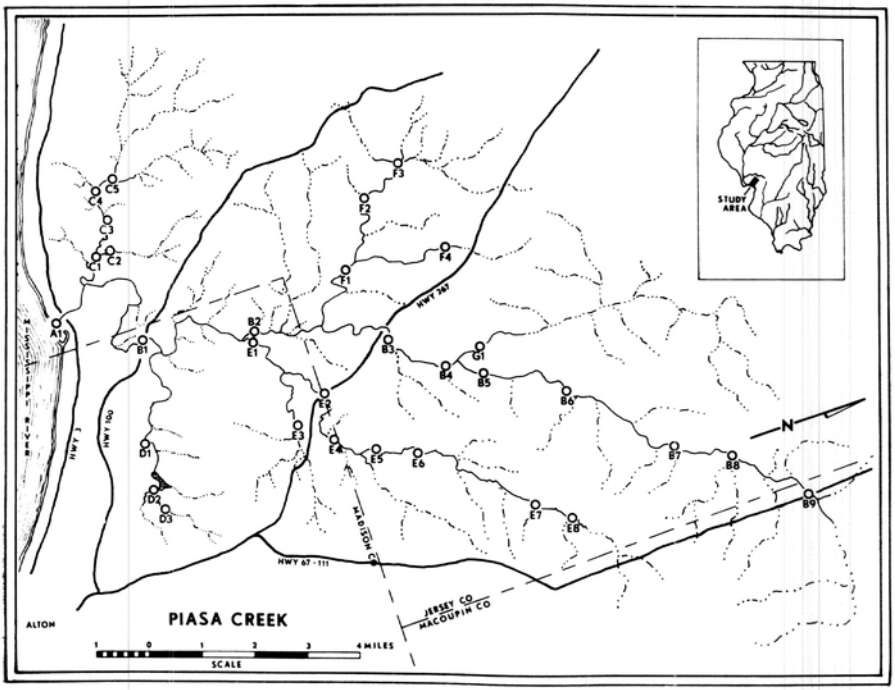

FIGURE 1. — The Piasa Creek system in west central Illinois. Collection sites marked with open circles. Sites A1, B1-B9 on Piasa Creek, sites C1-C5 on Mill Creek, D1-D3 on Rocky Fork, E1-E8 on "Little Piasa East", F1-F4 on "Little Piasa West", G1 on unnamed tributary of Piasa Creek.

METHODS AND MATERIALS

Most of the fish studied were collected by Smith and Twillman between 7 May 1967 and 23 August 1967. Five other collections made by classes at Southern Illinois University are included in the data. Previous to this study two collections totaling 198 specimens of 19 species had been deposited at the Illinois Natural History Survey (INHS). These two collections are listed under the site accounts but are not included in our data. All collections other than these two are deposited at the Southern Illinois University at Edwardsville (SIUE). Collections were made with 6, 10, and 15 by 6 foot woven nylon seines during daylight hours with a few exceptions. As noted in the site accounts a few collections were made with a 30 by 8 foot bag seine or at night. These methods did not adequately sample the lower portion of the main creek (A1 and B1) but we feel our samples are representative of the fish populations present at the rest of the sites.

COLLECTION SITES

The 31 sites collected are described below. Included are pertinent data pertaining to the collections made at each site. Each site is identified by letter and number (Figure 1) and located by longitude and latitude. Many are on unnamed roads but common locations are given where possible. The date of collection(s) follows the locality data. Total number of fishes taken is given in parentheses after the collection date. At sites which were collected more than once, collections are listed in chronological order and any unique conditions are given for each collection. Unless otherwise noted collections were made by Smith and Twillman.

SPECIES	A 1	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9	C 1	C 2	C 3	C 4	C 5	D 1	D 2	D 3	E 1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	F 1	F 2	F 3	F 4	G 1
	SITE																														
Dorosoma cepedianum	A	P		R																											
Carpiodes cyprinus		P		P	R	P	R																								
Catostomus commersoni		P		C			R	C	P		R			C	R				R	P							C	C	R		P
Campostoma anomalum			P	C	C	C	C	C	C		P	A	R	A	C				A	A	C	P	C	A	A	A	A	A	A	A	C
Chrosomus erythrogaster													P	A	A																
Hybognathus nuchalis		P		R	R																										
Notemigonus crysoleucas	P	R			R									R		A	P			R											
Notropis atheridinoides	C	A									A																				
N. dorsalis		A	A	A	A	A	A	A	A		P	P	P	C	C	P		A	A	A		A	A	A	C	C	A	A	C	C	A
N. lutrensis		A		C	C		R	R	R		A	P	C	P	R	C				C							R	P		A	
N. stramineus		A	C	C	C	P	R	R	R				C	P					C	C							R				P
N. umbratilis		R		P	P			R			C	P	A	C		R				P											
Phenacobius mirabilis		R		R				R	R				R							R											
Pimephales notatus		C	P	P	P			R			A	P	A	C	C	P				A							P	R	R	P	
P. promelas		P		R	P					A	R			R		C				P							R	P	R	R	
Semotilus atromaculatus		C	P	C	C	C	A	A	A		P	A	P	C	C	P	A		P	A	A	P	C	A	A	A	A	A	C	C	A
Ictalurus melas		R		R						R	C	R								R		R			P	R				P	
I. natalis				R	R				R		P		P	R	R																
Fundulus notatus		C	P	P							C		P	P						R											
Lepomis cyanellus	P	P		R	R			P	R	A	P		P	C	P	P				P		R	R	P	P		R	R		C	R
L. humilis	A	R		R	R															P											
L. macrochirus	A	P	P	R	C						P	C	P			C	C			C		R			P						R
Micropterus salmoides		R		R	R						R									R											
Etheostoma spectabile		P	C	C	P	C	C	C	A			R	R	C	P				C	C		C	C	C	A	P	A	P	P	P	C
Cottus carolinae														P	P																

TABLE 1.—Relative abundance of common species at 31 collecting sites on Piasa Creek. A=Abundant above 20%, C=Common 5-20%, P=Present 1-5%, R=Rare under 1%.

PIASA CREEK

A1: 38° 56′ 10″ N — 90° 17′ 12″ W, Piasa Creek Public Boat Ramp off Highway 3, 100 yards upstream from mouth; 5-17-66, (62), Thomerson and ichthyology class, bottom soft mud, many snags, width 100 to 150 feet, only shoreline seined.

B1: 38° 57′ 27″ N — 90° 16′ 15″ W, Piasa Creek and Highway 100; 4-5-66, (315), Thomerson and ichthyology class, water clear and white, current swift, bottom soft sand and gravel, width 5 to 20 feet, depth to 5 feet; 5-17-66, (138), Thomerson and ichthyology class, water turbid white, current swift, bottom sand and gravel, width 100 feet, depth to 6 feet, water high and hard to seine; 5-19-66, (27), Grover, Osborne, and Whipple, water turbid, bottom sand, gravel and mud, width 75 feet depth to 6 feet; 6-1-66, (70), O. M. Price (INHS); 7-11-67, (519), water slightly turbid, bottom sand and mud, width 10 to 20 feet, depth to 5 feet, some algae present; 8-23-67, (772), Smith, Twillman, Thomerson and McAffee (30 foot bag seine), water muddy, current flowing upstream, bottom sand, gravel and mud, width 8 to 20 feet, depth to 5 feet.

B2: 38° 59′ 15″ N — 90° 15′ 35″ W; 6-14-67, (143), water clear, bottom sand, width 5 to 15 feet, depth to 2 feet, pH 8.0, DH 23°.

B3: 39° 01′ 15″ N — 90° 14′ 30″ W; 8-1-63, (128), Braasch and P. W. Smith (INHS); 7-5-67, (1212), water clear, bottom sand, width 3 to 15 feet, depth 3 feet; 7-27-67 (Night, 2015-2115), (1249), water muddy, bottom sand and mud, width 4 to 15 feet, depth 3 feet; 9-29-67, (2379), Thomerson, Smith, Twillman and class, water slightly turbid white, bottom sand and silt, width 3 to 20 feet, depth to 3 feet. The same species were taken by day and night but about three times as many fish were taken with the same effort at night.

B4: 39° 01′ 58″ — 90° 13′ 40″ W; 7-5-67, (284), concrete ford creates a pool above ford, water clear, bottom mud and sand, width 3 to 15 feet, depth to 3 feet.

B5: 39° 02′ 30″ N — 90° 13′ 12″ W; 7-5-67, (278), water clear, bottom sand, width 2 to 5 feet, depth to 1 foot, mainly riffles.

B6: 39° 03′ 30″ N — 90° 12′ 20″ W; 7-27-67, (912), water clear, bottom sand, width 4 to 10 feet, depth 1 to 3 feet, water temperature 26° C.; some algae present.

B7: 39° 05′ 00″ N — 90° 10′ 23″ W; 7-27-67, (411), water muddy, bottom mud and gravel, width 6 to 10 feet, depth to 4 feet, water high due to rain, some algae, pools and riffles.

B8: 39° 05′ 50″ N — 90° 09′ 50″ W; 7-27-67, (674), water muddy, bottom sand and gravel, width 3 to 10 feet, depth 3 feet, pool and riffles.

B9: 39° 06′ 50″ N — 90° 08′ 30″ W; Highway 111 and Piasa Creek; 7-27-67, (127), water muddy, bottom mud and sand, width to 20 feet, depth to 4 feet, water 1 foot above normal. *Lepomis cyanellus* was dominant species.

G1: 39° 02′ 40″ N — 90° 13′ 45″ W; 7-5-67, (633), water clear, bottom sand, width 5 feet, depth 1.5 feet, on small side branch.

MILL CREEK

C1: 38° 57′ 10″ N — 90° 18′ 15″ W; 7-29-67, (108), water muddy, bottom mud, width 10 feet, depth to 6 feet, water high, current reversed; 8-23-67. (279), Smith, Twillman, Thomerson and McAffee, water slightly turbid, bottom sand, width 10 feet, depth to 3 feet.

C2: 38° 57′ 27″ N — 90° 18′ 16″ W; 7-29-67, (128), water muddy, bottom mud, width 10 feet, depth 3 feet, a single pool under bridge.

C3: 38° 57′ 01″ N — 90° 18′ 68″ W; 5-7-67, (122), water muddy, bottom sand, gravel and mud, width 3 to 5 feet, depth to 3 feet, pools and riffles.

C4: 38° 57′ 05″ N — 90° 19′ 55″ W; 5-7-67, (250), water muddy, bottom sand, gravel and mud, width 10 to 15 feet, depth to 4 feet, pools and riffles; 7-27-67, (1154), (night 2245-2330), water muddy, bottom sand and mud, width 4 to 15 feet, depth to 4 feet, *Chrosomus erythrogaster* dominant.

C5: 38° 57′ 25″ N — 90° 19′ 55″ W; 5-7-67, (150), water muddy, bottom sand and gravel, width 3 to 8 feet, depth to 3 feet, pool and riffles, *Chrosomus erythrogaster* dominant.

ROCKY FORK

D1: 38° 56′ 50″ N — 90° 14′ 12″ W; 6-14-67, (190), water turbid and green, bottom sand and rock, width 3 to 20 feet, depth to 3 feet, rock bottom pools and water falls, abundant algae and snails, *Notemigonus crysoleucas* dominant.

D2: 38° 56′ 50″ N — 90° 13′ 15″ W, located on property of Camp Warren Levis, Boy Scouts of America; 7-14-67, (27), water turbid and polluted, bottom sand and mud, width 15 to 20 feet, depth to 3 feet.

D3: 38° 56′ 52″ N — 90° 12′ 50″ W; 6-14-67, (32), water clear, bottom sand, width 3 feet, depth 1 foot, small riffles, *Notropis dorsalis* only species collected.

LITTLE PIASA CREEK — EAST

E1: 38° 59′ 10″ N — 90° 15′ 22″ W; 6-14-67, (401), water clear, bottom sand, width 2 to 10 feet, depth 2 feet, water temperature 31° C, pH 8.5, DH 22°.

E2: 38° 59′ 10″ N — 90° 15′ 22″ W, Little Piasa Creek and Highway 267, 2 miles NW of Godfrey; 4-19-66, (1023), Thomerson and ichthyology class, water clear white, bottom soft sand and gravel, width 5 to 20 feet, depth to 5 feet; 5-26-66, (79), Emons, Grover and Osborne, water turbid, bottom sand and gravel, width to 75 feet, depth to 6 feet, water high; 6-27-67, (1105), water clear, bottom sand, mud, rock and gravel, width 10 feet to 30 feet, depth to 5 feet, current strong over riffles and slow to none in pools.

E3: 38° 59′ 30″ N — 90° 13′ 30″ W; 7-27-67, (65), water clear, bottom sand, mud and rock, width to 12 feet, depth 1 to 2 feet, water temperature 24° C, pH 8.0, DH 18°.

E4: 38° 59′ 50″ N — 90° 12′ 59″ W; 7-6-67, (2148), Smith, Twillman and Thomerson, water clear, bottom sand and gravel, width 5 to 10 feet, depth to 2 feet, some algae present.

E5: 39° 00′ 25″ N — 90° 12′ 30″ W; 7-6-67, (1101), Smith, Twillman and Thomerson, water clear, bottom sand and gravel, width 3 to 8 feet, depth 1.5 feet, some algae present.

E6: 39° 01′ 05″ N — 90° 12′ 05″ W; 7-6-67, (1506), Smith, Twillman and Thomerson, water clear, bottom sand and gravel, width 2 to 4 feet, depth 1 foot, some algae present.

E7: 39° 02′ 35″ N — 90° 10′ 10″ W; 7-21-67, (299), water turbid, bottom rock, gravel and mud, width 3 to 8 feet, depth to 4.5 feet, large rocks on bottom, *Etheostoma spectabile* dominant.

E8: 39° 03′ 10″ N — 90° 09′ 40″ W; 7-21-67, (337), water muddy, bottom sand and mud, width to 3 feet, depth to 1 foot, very small.

LITTLE PIASA CREEK — WEST

F1: 39° 00′ 55″ N — 90° 16′ 10″ W; 6-20-67, (519), water slightly turbid, bottom mud and gravel, width 5 to 15 feet, depth 2 feet.

F2: 39° 01′ 35″ N — 90° 17′ 29″ W; 6-20-67, (722), water slightly turbid, bottom mud and rock, width 5 to 10 feet, depth 2.5 feet.

F3: 39° 02′ 22″ N — 90° 17′ 53″ W; 6-20-67, (1158), water slightly turbid, bottom sand and rock, width 1 to 5 feet, depth 2 feet, some algae present.

F4: 39° 02′ 36″ N — 90° 15′ 55″ W; 6-20-67, (427), water slightly turbid, bottom mud and gravel, width 15 feet, depth 3.5 feet, large pool, several large *Ictalurus melas* taken.

MINOR SPECIES

A total of 44 species were taken from the drainage during this study and undoubtedly other species occur in the lower portion of Piasa Creek. Due to heavy public usage and other factors we were not able to adequately sample the creek below site B1. The total number of each species collected is followed by sites and respective numbers in each collection. Where a site was collected more than once the numbers of specimens in each collection are listed in chronological order as in the Site Accounts. Nineteen species taken only in the lower portions of the drainage are as follows: *Dorosoma cepedianum* (LeSeuer), gizzard shad; Total—65, A1—13; B1—9, 38; B3—1, 5. *Hiodon alosoides* (Rafinesque), goldeye; Total—1; B1—1. *Carpiodes carpio* (Rafinesque), river carpsucker; Total—16; B1—4, 10, 2. *Carpiodes cyprinus* (LeSeuer), quillback; Total—113; B1—1, 18; B3—4, 27, 55; B4—2; B5—4; B6—2. *Ictiobus bubalus* (Rafinesque), small mouth buffalo; Total—17; B1—10, 6; B3—1. *Ictiobus cyprinellus* (Valenciennes), bigmouth buffalo; Total—1; B1—1. *Cyprinus carpio* Linnaeus, carp; Total—2; B1—1; C1—1. *Notropis blennius* (Girard), river shiner; Total—66; B1—58, 8. *Pimephales vigilax* (Girard), bullhead minnow; Total—5; B1—5. *Ictalurus punctatus* (Rafinesque), channel catfish; Total—17; B1—11, 6. *Labidesthes sicculus* (Cope), brook silverside; Total—7; B1—2, 5. *Aphredoderus sayanus* (Gilliams), pirate perch; Total—1; B1—1. *Morone crysops* (Rafinesque), white bass; Total—10; B1—1, 9. *Morone mississippiensis* (Jordan and Eigenmann), yellow bass; Total—3; A1—3. *Pomoxis annularis* (Rafinesque), white crappie; Total—6; A1—6. *Pomoxis nigromaculatus* (LeSeuer), black crappie; Total—2; A1—1; B1—1. *Percina caprodes* (Rafinesque), logperch; Total—4; B1—4. *Stizostedion vitreum* (Mitchill), walleye; Total—9; B1—9. *Aplodinotus grunniens* (Rafinesque), freshwater drum; Total—7; A1—1; B1—2, 4.

Dorosoma cepedianum was taken from pools in muddy water. With the exception of one large specimen, 12 in. long (Total Length), all specimens were under 6 in. long. Of the two species of carpsucker found *C. cyprinus* was the most numerous. Larger specimens (to 9.5 in.) were taken at B1 but all specimens taken upstream from there were young of the year. The *C. carpio* taken only at B1 were all small, less than 6 in. long. All buffalo were small (to 3 in.). Carp are probably common in the lower portion of the creek but only two small specimens were taken. *Notropis blennius* was found in fair numbers at B1 but probably does not ascend much further upstream. *Ictalurus punctatus* were taken only at B1 and all were small (to 5 in.). *Morone crysops* were more common than *Morone mississippiensis* but all specimens of both species were small, less than six in. long. The single collection of *Percina caprodes* was made from a deep pool at B1 when the river was high and flow at this site was reversed. *Stizostedion vitreum* taken at the same time were under seven in. long. All *Aplodinotus grunniens* were six in. or less.

Seven other species were taken only in small numbers. They are as follows: *Moxostoma erythrurum* (Rafinesque), golden redhorse; Total—34; B1—1, 1, 7, 12, 5; B3—3, 3; E2—2. *Hybognathus nuchalis* Agassiz, silvery minnow; Total —14; B1—5, 6; B3—2; B4—1. *Notemigonus crysoleucas* (Mitchill), golden shiner; Total—130; A1—3; B1—3; B4—1; C4—1; D1—115; D2—1; E2—6. *Phenocobius mirabilus* (Girard), suckermouth minnow; Total—12; B1—3; B3—2, 1, 1; B7—1; B8—1; C3—1; E2—2. *Gambusia affinis* (Baird and Girard), mosquitofish; Total—1; B1—1. *Lepomis humilis* (Girard), orangespotted sunfish: Total—26; A1—14; B1—2, 1, 1, 2; B3—1, 3; B4—1; E2—1. *Micropterus salmoides* (Lacépède), largemouth bass; Total—7; B1—1; B3—1, 1; B4—2; C1—1; E2—1.

Except for a single specimen 15 inches long all *M. erythrurum* were under eight inches long. Trautman (1957) stated that the golden redhorse "was intolerant of continuous turbidity and rapid silting of stream bottoms." This may be the reason for its uncommon occurrence in Piasa Creek. *Hybognathus nuchalis* were collected only from large pools in the main creek and are probably more abundant in the lower portion of Piasa Creek than our sample indicates. *Notemigonus crysoleucas* were rare with exception of site D1 where they are dominant. Apparently the reduction of other competing species in this area as a result of pollution has allowed the golden shiner to establish a sizable poulation.

As is usual when several riffle dwelling minnows are present, *P. mirabilus* is rare but was found at scattered localities throughout the drainage. Though only a single *G. affinis* was taken, several dozen were seen but not collected at D3 on 21 September 1967. *Lepomis humilis* was found in good numbers around the shore at the mouth and is probably common in the lower reaches of Piasa Creek. The few specimens of *M. salmoides* collected were all young of the year. In the course of collecting fishes for this study we also took a number of crayfish belonging to the genus *Orconectes*. The common crayfish in Piasa Creek is *O. virilis*. Less common is *O. immunis*.

Major Species

The relative abundance of these common species at all collecting sites is given in Table 1.

Catostomus commersoni (Lacépède), white sucker; Total—528; B1—3, 18; B3—118, 41, 78; B6—4; B7—30; B8—14; C1—1; C4—3, 81; C5—1; E1—2; E2—11, 28; F1—29; F2—45; F3—10; G1—11. This is the common sucker in the drainage and made up 2.2% of the total sample. White suckers were found in all of the larger portions of the drainage system. Males running milt were taken on 19 April 1966 and young of the year on 14 June 1967. Large specimens were taken from all of the deep pools sampled in the main creek. At E2, in addition to the 28 specimens retained, 13 large individuals were released. We would agree with Trautman (1957) that white suckers "appeared to be more tolerant to turbidity, siltation and other organic and inorganic pollutants than any other sucker." The white sucker was found in all branches of the drainage with the exception of Rocky Fork. Apparently this branch is too polluted for even this tolerant species.

Campostoma anomalum (Rafinesque), stoneroller; Total—4436; B2—4; B3—163, 217, 401; B4—48; B5—53; B6—70; B7—58; B8—83; C1—3; C2—61; C3—1; C4—31, 470; C5—22; E1—85; E2—221, 40, 60; E3—12; E4—84; E5—195; E6—360; E7—77; E8—163; F1—112; F2—171; F3—870; F4—178; G1—123. The stoneroller is a common species in the

drainage, 18.8% of the total sample. Outside of Rocky Fork, it was found at all sites except three. Although there seems to be much suitable habitat and food it is presumably excluded from Rocky Fork by pollution. Young of the year were first taken in June.

Chrosomus erythrogaster (Rafinesque), southern redbelly dace; Total—430; C3—2; C4—68, 295; C5—65. The southern redbelly dace occurs as an isolated population in upper Mill Creek, and was taken at only three localities. In collections from C4 and C5 it comprised 25.5% to 43.3% of the sample. Forbes and Richardson (1908) did not report *Chrosomus erythrogaster* from this part of the state. The presently known state distribution of the species, however, includes the northeastern quarter of the state and 2 small areas in the central part of the state, one of which includes the study area. A single collection has been made in Jackson County in southern Illinois (Phillip W. Smith, personal communication).

Notropis atherinoides (Rafinesque), emerald shiner; Total—869; A1—4; B1—118, 10, 197, 430, 5; C1—96, 9. The emerald shiner was collected only in the lower portions of the drainage. This agrees with Smith (1965) who lists it as occurring in the larger and medium sized rivers throughout Illinois. It is abundant where found and may make up as much as 55% of the sample.

Notropis dorsalis (Agassiz), bigmouth shiner; Total—8032; B1—84, 38, 1, 4, 5; B2—103; B3—1144, 559, 659; B4—71; B5—141; B6—462; B7—156; B8—226; C1—4; C2—6; C3—17; C4—27, 18; C5—20; D1—7; D3—32; E1—249; E2—65, 300; E4—1689; E5—607; E6—591; E7—47; E8—35; F1—119; F2—232; F3—102; F4—28; G1—183. The bigmouth shiner made up 34.2% of the total sample and is the dominant species throughout the drainage. It was collected at all but five sites and in most collections makes up from 25% to 78% of the sample. Young of the year first appeared in collections on 20 June.

Notropis lutrensis (Baird and Girard), red shiner; Total—1093; B1—38, 17, 124, 12, 4; B3—93, 29, 168; B4—21; B6—1; B7—2; B8—6; C1—79, 53; C2—2; C3—11; C4—9, 3; C5—1; D1—13; E2—66, 13, 200; F1—2; F2—18; F4—96. The red shiner was found generally throughout the system but only amounted to 4.6% of the total sample. It usually made up about 10% of the sample when present. Forbes and Richardson (1908) reported that *Notropis lutrensis* spawns from the middle of May to the last of June. However, we collected young of the year as early as April and males in breeding color were taken as late as October 29.

Notropis stramineus (Cope), sand shiner; Total—603; B1—41, 40, 17; B2—11; B3—96, 89, 40; B4—30; B5—8; B6—5; B7—3; B8—2; C1—8; C3—11; C4—11, 41; E1—21; E2—42, 67; F1—4; G1—16. The sand shiner was found in the deeper portions of the drainage mainly over sand bottom. Young of the year were collected as early as April. It was not found as far upstream as *N. dorsalis*.

Notropis umbratilus (Girard), redfin shiner; Total—215; B1—1; B3—10, 7, 15; B4—8; B7—3; C1—8; C2—5; C3—31; C4—20, 3; D1—1; E2—49, 54. The redfin shiner was found throughout the system, but seldom in large numbers. Forbes and Richardson (1908) reported females bursting with eggs were taken about the first of June. This agrees with our taking the first specimens of young of the year on 27 July.

Pimephales notatus (Rafinesque), bluntnose minnow; Total—971; B1—7, 12, 23, 5; B2—2; B3—29, 8, 60; B4—9; B7—2; C1—3, 66; C2—4; C3—30; C4—34, 41; C5—13; D1—6; E2—399, 180; F1—11; F2—7; F3—3; F4—17. The bluntnose minnow was found generally distributed throughout the drainage and makes up 4.1% of the total sample. Males and females in breeding condition were first collected on 7 May. Forbes and Richardson (1908) reported the spawning season in central Illinois as May 15 to June 15. This agrees with our data.

Pimephales promelas (Rafinesque), fathead minnow; Total—167; B1—2, 1; B3—13, 5, 5; B4—9; B9—56; C1—1; C4—1; D1—25; E2—3, 13; F1—5; F2—26; F3—2; F4—3. The fathead minnow was found throughout the drainage over mud bottom. Males in breeding condition were taken on 26 May. Trautman (1957) stated "the fathead and bluntnose minnows were competitors, and the fathead occurred in greatest population densities only where the bluntnose was absent or comparatively few in numbers." The fathead was abundant at only two sites, D1 and B9. At these sites it made up 13.1% and 44.0% of the total sample respectively. The bluntnose on the other hand made up only 3.1% of the sample at D1 and was absent at B9. At all sites where the bluntnose was abundant the

fathead did not exceed 1.5% of the total sample.

Semotilus atromaculatus (Mitchill), creek chub; Total—3071; B1—36; B2—7; B3—54, 95, 278; B4—51; B5—45; B6—278; B7—83; B8—175; C1—6; C2—30; C3—6; C4—12, 58; C5—16; D1—5; D2—23; E1—16; E2—42, 104, 16; E3—53; E4—105; E5—156; E6—391; E7—67; E8—129; F1—123; F2—209; F3—104; F4—62; G1—200. The creek chub occurred at all but three sites and was the third most abundant species (13.1% of the total sample). Ripe females were taken on 19 April and the first young of the year were taken on 14 June.

Ictalurus melas (Rafinesque), black bullhead; Total—53; B1—1, 1, 1; B3—1; B9—1; C1—18; E2—5, 5; E4—1; E7—6; E8—1; F4—11. The black bullhead was taken mainly from the deep mud-bottomed pools throughout the drainage.

Ictalurus natalis (LeSeuer), yellow bullhead; Total—21; B3—1, 7, 4; B4—1; B8—1; C1—3; C3—2; C4—1; C5—1. The yellow bullhead was found in only the main branch of Piasa and in Mill Creek in larger pools. Forbes and Richardson (1908) reported that the black and yellow bullheads show an observable tendency of local separation. Our data tend to support this statement.

Fundulus notatus (Rafinesque), blackstripe topminnow; Total—166; B1—7, 12, 94; B2—5; B3—1, 1, 26; C1—6, 4; C3—2; C4—3; E2—4, 1. The blackstripe topminnow was taken from sites which contained relatively still water in large pools with an abundance of debris present. An extremely variable sized population exists downstream from B1, at times quite large.

Lepomis macrochirus Rafinesque, bluegill; Total—239; A1—16; B1—3, 7, 32, 18, 1; B2—2; B3—9, 9, 9; B4—20; C1—3, 7; C2—18; C3—2; D1—14; D2—3; E2—5, 1, 4; E4—1; E7—9; G1—1. The bluegill is scattered throughout the drainage in small numbers.

Lepomis cyanellus Rafinesque, green sunfish; Total—281; A1—1; B1—1, 4, 3, 6; B3—3, 6, 11; B4—2; B7—5; B8—2; B9—70; C1—7; C3—5; C4—14, 13; C5—4; D1—4; E2—39, 2; E4—7; E5—4; E6—26; E7—7; F1—2; F2—1; F4—26; G1—6. The green sunfish is ubiquitous throughout the system.

Etheostoma spectabile (Agassiz), orangethroat darter; Total—1681; B1—7, 2; B2—9; B3—52, 80, 36; B4—7; B5—27; B6—90; B7—68; B8—164; C2—1; C3—1; C4—11, 94; C5—5; E1—28; E2—103, 3, 5; E4—261; E5—139; E6—138; E7—86; E8—9; F1—112; F2—13; F3—31; F4—6; G1—93. The orangethroat was found in abundance throughout the drainage, with the exception of Rocky Fork. It was collected mainly from the riffles although many specimens were taken from shallow pools. The orangethroat was the fourth most common species and made up 7.1% of the total sample.

Cottus carolinae (Gill), banded sculpin; Total—43; C4—7, 34; C5—2. The banded sculpin was found at only two localities and in association with the redbelly dace. During the day it was kicked from the riffles but at night it was taken from all parts of the stream. Forbes and Richardson (1908) reported a single collection of the banded sculpin from a spring in Jersey County. The previously known statewide distribution included a small area just north of Piasa Creek in west central Illinois and the extreme southern tip of the state (Phillip Smith, personal communication).

Discussion

The lower portion of Piasa Creek at least upstream to B1 is a highly unstable habitat under the influence of the river and has certainly been greatly altered by the operation (since 1938) of the Lock and Dam No. 26 on the Mississippi River below the mouth of the creek at Alton, Illinois. When the river level is high, turbid water flows upstream at least as far as B1 and C1 (see Site Accounts) and considerable silt and mud are deposited on the bottom. When the river level is low and the creek flow high, there is scouring of the silt to leave a clean sand and gravel bottom under clear flowing water. There seems to be considerable movement of fishes into and out of this area (around B1) depending on water and bottom conditions. A total of 38 out of the 44 species collected in the system were taken at B1 but no more than 26 in a given

collection. Below B1 many more river species probably occur than our data would indicate. Below this point the creek becomes too large for effective collecting, the banks are private property and there is considerable boat traffic.

The *Chrosomus erythrogaster* record from Mill Creek is of considerable interest. The nearest Illinois records are from northeastern Calhoun and southeastern Pike counties, west of the Illinois River (Phillip W. Smith, personal communication). Though *C. erythrogaster* occurs north of the Missouri River on the Missouri side of the Mississippi these populations are separated from Piasa Creek by broad areas of unsuitable habitat. The *Cottus carolinae* record is of similar interest, however, this species has been taken in Otter Creek, a Macoupin Creek tributary just northwest of Mill Creek (Lopinot, 1968). No *C. erythrogaster* were taken at the Otter Creek locality and large numbers of *N. lutrensis* were present (34.4% of total sample, Lopinot, 1968, p. 114, Table 4). At the sites in upper Mill Creek *N. lutrensis* is present but not abundant. We suspect that *C. erythrogaster* and *C. carolinae* may have been present both in Rocky Fork and the lower portion of the main creek before these areas were altered by human activity. Before the lower portion of the creek was flooded, it was probably a clean gravel and sand bottomed stream. Rocky Fork was probably a clear flowing rock and gravel bottomed stream before the advent of pollution from several sewage lagoons draining into the creek above Warren Levis Lake as well as seepage from septic tanks serving the many subdivisions in the area. A large fish kill, with largemouth bass as large as 4 or 5 pounds dying, was observed by Smith in the spring of 1965. The kill occurred in Warren Levis Lake and in Rocky Fork downstream from the lake.

Other than the species discussed above, the fishes of Piasa Creek include wide ranging and ubiquitous Upper Mississippi Valley small stream fishes such as *Notropis dorsalis*, *N. stramineus*, *N. lutrensis*, *N. umbratilis*, *Semotilus atromaculatus*, *Pimephales notatus*, *Campostoma anomalum*, *Catostomus commersoni*, *Lepomis cyanellus*, and *Etheostoma spectabile*.

Acknowledgments

We wish to thank the various class members and others, as listed with the Site Accounts, for their assistance in making collections. Mr. William L. Pflieger, Missouri Department of Conservation, and Dr. Phillip W. Smith, Illinois Natural History Survey, aided with identification of fishes. We also wish to thank Dr. Smith for his courtesy during our visits to his institution. Dr. Dorothy Gore, Southern Illinois University at Edwardsville, supplied the information on the geology of the region. Crayfish identifications were made by Mr. Rollin D. Reimer, Oklahoma State University.

This paper was read in part at the 1968 annual meeting of the Academy. Smith's portion of the study was done as part of a Science and Technology Undergraduate Honors program at the Southern Illinois University at Edwardsville supported in part by Faculty Research Grant 5-02-10 to Thomerson.

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Manuscript received June 17, 1968.