

THE EFFECTS OF MAN-MADE MODIFICATIONS ON  
THE FISH FAUNA IN LOST AND GORDON  
CREEKS, OHIO, BETWEEN 1887-1938

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If the fundamental principals regulating the present numerical abundance of a species are to be understood, it is necessary to obtain some understanding of the numerical fluctuations of that species over a comparatively long period of time and to learn the reasons for such fluctuations. Research to determine these facts is not very difficult with such conspicuous animals as the black bear, white-tailed deer, passenger pigeon, or bob-white. It is more difficult with fishes, principally because of the inability of early observers to identify correctly these usually inconspicuous animals. As a consequence, there are few dependable observations in Ohio on fishes during early historic time. One of the finest series of observations available is from the Lost and Gordon creek systems of the Maumee drainage, in Defiance and Paulding counties of western Ohio.

This portion of the Maumee Valley was first invaded by small numbers of white men early in the eighteenth century. Fort Defiance, Defiance County, was built in 1794, and this site, where the city of Defiance now stands, has since been continuously occupied by the white man. Before 1794 Indians had a settlement there, which extended along the Maumee River for a considerable distance (Howe, 1902: 541-542). Adjacent to the village there was said to have been "highly cultivated" land "with one thousand acres of corn besides immense apple and peach orchards."

Despite early occupancy about the present site of the city of Defiance, the counties of Defiance and Paulding were not heavily settled, nor was much land cultivated, until after 1850. These counties lay principally in the Black Swamp, and the topography of this swamp prohibited ready drainage. Extensive ditching was not begun until after 1850. Even as late as 1874 (Winchell, 1874a: 438) almost two-thirds of Defiance County still contained heavy forests. In Paulding County "about eighty-nine per cent of the acreage was classified as

uncultivated" and deer, black bears and wolves were still sufficiently numerous to attract hunting parties from as far distant as southern Ohio (Winchell, 1874b: 335-336).

The first published ichthyological explorations of Defiance County began in 1887, during the early period of swamp drainage and forest removal. In July of that year Meek<sup>1</sup> made his investigations of the Lost and Gordon creek systems. In 1889 Meek (1889: 435-440) published a list of the fishes captured, indicated their abundance, and gave a short, accurate description of the streams and adjacent country.

Meek stated that he seined in the following localities, spending less than a day in each: Gordon Creek about one mile above its mouth; the same creek about ten or twelve miles upstream near Cicero;<sup>2</sup> and Lost Creek about two and a half miles southwest of Farmer. He described Gordon Creek as small, containing little or no flowing water in summer, and with the pools becoming nearly dry at that season. When he seined the stream near its mouth in 1887 it had ceased to flow and collecting was done in a few *deep holes*. The creek near Cicero was little more than a small brook with a muddy bottom and occasional stretches of sand. Meek stated that Lost Creek was larger than Gordon, and that it had a more sandy bottom; that it was fed by springs in the headwaters, and was seldom, if ever without running water. A few miles below Farmer, Lost Creek lost itself in a large marshy tract of land that was covered with a dense growth of underbrush.<sup>3</sup>

Meek mentioned that formerly the greater portion of Defiance County was heavily timbered, and that within the past thirty years much land had been cleared. He also stated that although large woodland remnants remained, most of them had been depleted of their best timber, and the remaining trees had been more or less injured by fire. Meek's description of the country agrees with those of other competent writers of that period and region.

A rather detailed survey of the Maumee river system was made in the summer of 1893 by Philip H. Kirsch. His report

<sup>1</sup>Seth E. Meek, one of America's outstanding ichthyologists, was born in 1859 at Hicksville, Defiance County, Ohio. His investigations were conducted in Farmer, Mark and Hicksville townships, Defiance County.

<sup>2</sup>This former village is not usually shown on recent maps. It was located in northeast Hicksville Township, Defiance County. See U. S. Geol. Surv. map, Bryan Quadrangle, Ohio; 1914.

<sup>3</sup>Seemingly that portion of Mark Township that is enclosed in a dotted line on Winchell's map (1874a: opp. p. 422).

(1895: 315-337) gives us an accurate conception of the numerical status of many fish species throughout the Maumee system, which materially assists in our understanding of the population fluctuations and physical modifications that have occurred in the creeks under discussion. Kirch included Meek's data in his report but did not personally investigate Lost or Gordon creeks.

Dr. Raymond C. Osburn and Mr. Edward L. Wickliff began in 1920 a state-wide survey of fishes for the Ohio Division of Conservation, which included collecting in the Maumee drainage. I began to assist in this survey in 1925 and since have made many collections in the Maumee system. I first collected in Lost and Gordon creeks in 1930, and was then assisted by Mr. Robert B. Foster.

On May 22 and 30, 1938, Mr. George A. Moore<sup>4</sup> and I began the investigations of Lost and Gordon creeks which have made this comparative study possible. We collected fishes in every locality seined by Meek, and in eight others as well. The major physiographic features of both stream systems were observed, as were the major floral types. It was apparent that vast modifications had occurred in the streams and watersheds since 1887. All except small sections of the streams had been dredged or straightened. Dredging to a depth of fifteen and twenty feet had completely drained that section of Lost Creek where the stream had formerly "lost itself in a large marshy tract of land (Meek, 1889: 435)." In several localities dredging had penetrated into a hard pan of grayish-blue clay. The most recently dredged sections contained no pools or well-defined riffles, the depth of water was uniformly shallow and the bottom cover was almost or entirely absent. Wherever hard-pan occurred it was swept clean except for occasional, small accumulations of sand and small-sized gravel. Rooted aquatic vegetation was absent. Wherever the dredging had occurred five or more years previously, bank cutting, and occasional lodged stumps and timber had begun to cause the formation of pools and sand bars. The straightening and dredging of the former, meandering creeks caused the formation of ox-bows. Some of the ox-bows were only a few yards, others were almost a mile in length. Many were connected with a dredged ditch except in periods of low water. Some contained a series of interrupted pools. None had flowing water. All possessed a profusion of

<sup>4</sup>I wish to acknowledge indebtedness to Mr. Moore, of the Oklahoma Agricultural and Mechanical College, for his assistance in the collection of field data.

algae, and some contained much submerged and emergent rooted aquatic vegetation.

The undredged portions of both stream systems were in the headwaters. These sections were characterized by well-defined pools of as great as seven feet in depth, in which was usually an abundance of timber, boulders, gravel, rooted aquatic vegetation and other cover for fishes. The riffles were likewise well-defined and contained much cover in the form of boulders, gravel and vegetation. It is assumed that conditions in these undredged sections, and particularly where they flowed through woodlands, were comparable to conditions in 1887.

Because of topographical features the headwaters of Lost Creek, and to a lesser extent of Gordon Creek, are very different from the lower courses. Many of the tributaries of Lost Creek and a few of those of Gordon Creek began at about 825 feet above sea level, and in the first one or two miles of their course drop to 750 feet.<sup>5</sup> At about the 750 foot level the streams enter the former Black Swamp, and in the remaining 3 to 15 miles descend only about 50 feet. Most of the headwater tributaries flow at right angles through a series of ridges, of which two are outstanding. These lie parallel to each other, and cross Hicksville and Farmer townships, Defiance County, in a northeast-southwest direction. The upper one has been called the lower margin of the St. Mary's Ridge, and the other the Van Wert Ridge (Winchell, 1874a: 430, and map opp. p. 422). Springs and artesian wells are numerous on these uplands and particularly about the headwaters of Lost Creek. The soil on the uplands is of moderate fertility, is readily eroded, and often contains much gravel, sand and many boulders. Occasional sand blow-outs occur. The flora of the most sandy portions is of an oak-opening type. The former forests have been reduced to remnant woodlands and woodlots, and are usually grazed. The meadows are often heavily grazed, and all except an occasional fence row or stream bank is under some form of cultivation.

The lower courses of the streams, which formerly meandered across the Black Swamp, now traverse a level, well-drained plain whose usually dark, sandy-loam soil is in general very fertile. The remnant woodlands, of swamp-forest type, are few and are generally grazed. The remaining portion of the plain is under intensive cultivation except for an occasional fence row

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<sup>5</sup>See U. S. Geol. Surv. map. Bryan Quadrangle, Ohio; 1914.

or stream bank. The loamy soil erodes rapidly along the stream banks and wherever there is sufficient slope.

Meek's report indicates that he found collecting conditions favorable in 1887, and that a fairly representative sample of the fish fauna was obtained. Collecting in 1938 was conducted under extremely favorable conditions, and all habitat types were given equal attention. Table I compares the results of these two investigations.<sup>6</sup>

It will be observed that Meek recorded 22 species from Lost Creek, 21 species from Gordon Creek, and had a total of 26 species from both. I collected 30 species in Lost Creek, 26 in Gordon Creek, and had a total of 33 species for both. Together Meek and I obtained a total of 41 species for the two systems.

Meek recorded 7 species which I failed to obtain. Of these *Dorosoma cepedianum*, *Moxostoma duquesnii*, *Notropis volucellus*, *Esox vermiculatus*, and *Lepomis megalotis* probably still occur in the two systems and further collecting might reveal them. Since all five are essentially pool or bayou inhabitants I assume that recent dredging has decreased the amount of their habitat and greatly disturbed much of that remaining. Consequently their numbers have decreased. The fish recorded by Meek as *Chrosomus erythrogaster*, if that species, occurred as a relict in the clear, spring streams of the uplands. If the species was the bog-inhabiting *Chrosomus eos*, then it inhabited the Black Swamp proper. The former species seems the most logical.<sup>7</sup> I was unable to find the lowland-inhabiting *Aphredoderus sayanus*, a species recorded only in one other locality in Ohio. It has probably become extirpated with the draining of the Black Swamp.

I collected 15 species which Meek failed to obtain. Of these *Carpiodes cyprinus*, *Minytrema melanops*, *Notemigonus crysoleucas*, *Schilbeodes gyrinus*, *Fundulus notatus*, and *Cottus bairdii* were assumed to have been present in 1887. *Hypentelium nigricans* and *Notropis deliciosus* may have been present but probably have become more numerous recently with the

<sup>6</sup>Since Meek employed comparative terms I have done likewise. In most instances these terms are adequate for the present purpose.

<sup>7</sup>I have corresponded with Dr. Alexander Wetmore of the National Museum, Mr. Alfred C. Weed of the Field Museum, and Mr. H. Walton Clark of the California Academy of Science concerning the existence of specimens collected by Meek in Lost and Gordon Creeks. None are present in any of these institutions. In a letter of January 24, 1939, Dr. Wetmore informed me that, although Meek obtained U. S. Nat. Mus. catalogue numbers for his specimens, the fish were probably never forwarded to that Museum. Because of failure to find Meek's material I have been unable to recheck his identifications.

increase in amount of sandy riffles and pools. *Moxostoma erythrurum* and *Moxostoma rubreque* were probably present, and if so were recorded, in part at least, as *Moxostoma duquesnii*. *Cyprinus carpio* was probably not present in Lost and Gordon Creeks in 1887, since the first introductions in the Maumee system had taken place only a few years before (Cole, 1905: 547). *Phenacobius mirabilis*, a species readily identified, was not recorded in the Maumee drainage until 1920 (Osburn, Wickliff and Trautman, 1930: 173). Since then this inhabitant of roily, prairie-like streams has numerically increased so rapidly that it is now one of the dominant species throughout the Maumee drainage. I assume that the bullheads recorded by Meek as *Ameiurus nebulosus* were *Ameiurus natalis*. *A. nebulosus* is seldom found in small streams in Ohio and is numerous only in ponds, lakes or large rivers. *A. natalis* is abundant in small streams similar to the undredged portions of Lost and Gordon Creeks, and in these streams I found them in good numbers. *Etheostoma blennioides* was probably present but may have invaded the two systems since the draining of the Black Swamp. *Pomoxis annularis* should have been present in 1887. Its numbers may have recently increased because the species thrives in roily water, and has been stocked repeatedly in the two systems in recent years.

The most interesting facts are obtained from a comparison of the numerical status of species collected by both Meek and me, and from a study of conditions in which these fish were found. Table I and additional data indicates:

The collections from *undredged* sections show that, with few exceptions, there has been little change in numerical abundance of the various fish species in these sections between 1887 and 1938.

The collections from *dredged* sections indicate that, with few exceptions, there has been a drastic change in numerical abundance of the various fish species in these sections between 1887 and 1938.

The food fishes, including the sucker *Catostomus commersonnii*, suckers of the genus *Moxostoma*, bullheads of the genus *Ameiurus*, and all sunfish species except possibly *Pomoxis annularis*, were notably less numerous in 1938 than in 1887. Their numerical decrease was apparently the result of dredging, which has destroyed much of their habitat.

The forage fishes that displayed the greatest decrease in numbers were those requiring clear water, a constant flow, well-defined pools, or aquatic vegetation. Included in this group were such species as *Nocomis biguttatus* and *Rhinichthys atratulus*. These were numerous only in undredged sections.

The forage fishes that displayed the greatest numerical increase are all tolerant of dredged conditions with its resultant increase in turbidity of water and accumulation of clean-swept sand, rapid fluctuations in height of flow and speed of current, and lack of rooted aquatic vegetation and other cover. *Ericymba buccata*, the recent invader *Phenacobius mirabilis*, and *Pimephales promelas*, are excellent examples.

Although food fishes have decreased numerically, no obvious change in total numbers of forage fishes is apparent. Seemingly the increase in numbers of those forage species tolerant to dredged conditions tends to balance the numerical decrease of those not tolerant to dredging. Therefore from a cropping standpoint the streams today are essentially bait producers.

Ichthyological investigations of the past and present show that some species, which are rather generally distributed elsewhere in Ohio in similar habitats, are conspicuously absent in Lost and Gordon Creeks. The clear, undredged headwaters seem particularly suited to the big-eyed chub *Hybopsis amblops amblops* (Rafinesque); the rosy shiner *Notropis rubellus* (Agassiz); the rainbow darter *Poecilichthys coeruleus* (Storer); and the fan-tailed darter *Catnotus flabellaris flabellaris* (Rafinesque). Since Kirsch (1895), E. L. Wickliff, myself and others have found these species very rare or absent in the Black Swamp section of the Maumee drainage, may it not be that they have been unable to penetrate the lowland streams and thus reach the upland tributaries with their apparently suitable habitats?

Investigations also indicate that such species as the silver mullet *Moxostoma anisurum* (Rafinesque); the yellow stone catfish *Noturus flavus* Rafinesque; the brindled madtom *Schilbeodes miurus* (Jordan); the mud pickerel *Esox vermiculatus* Le Sueur; and the northern sand darter *Ammocrypta pellucida pellucida* (Baird), were more numerous in the Maumee drainage in 1893 (Kirsch, 1895) than subsequently. It is suggested that possibly their apparent numerical decrease was the result of a reduction in the amount of habitat suitable for them.

The collecting in the Lost and Gordon systems has not produced one small-mouthed bass *Micropterus dolomieu dolo-*

*mieu* Lacépède or a large-mouthed bass *Huro salmoides* (Lacépède), and this despite repeated plantings during recent years. Both species have been in the Maumee River adjacent to Gordon Creek since 1887 (Meek, 1889: 439), and therefore could have readily invaded that stream. Anyone acquainted with the ecological conditions under which the two bass species live in Ohio streams can readily understand why these species are not numerous in Lost and Gordon Creeks. This is particularly true of dredged sections.

In conclusion I wish to point out that in Ohio the absence of game species and the recent decrease of pan and food fishes is not confined to the Lost and Gordon systems. Man-made modifications, such as are now present in these systems, are also present in much of Ohio's waters. One needs only to study the past and present numerical status of Ohio fishes to realize the truth of this statement.

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TABLE I. RELATIVE ABUNDANCE OF VARIOUS FISH SPECIES AS RECORDED IN 1887 AND 1938

SPECIES	1887 (Meek)			1938 (Trautman)				
	LOST CREEK (Undredged)	GORDON CREEK (Undredged)	REMARKS	LOST CREEK		GORDON CREEK		REMARKS
				Dredged	Undredged	Dredged	Undredged	
<i>Dorosoma cepedianum</i> (Le Sueur) Gizzard Shad		Rather abundant near mouth						Probably occurs at present near mouth of Gordon Creek
<i>Carpiodes cyprinus</i> (Le Sueur) Quillback				one adult		A few young in 1930		Young are numerous in some dredged streams of Paulding and Defiance counties
<i>Catostomus commersonnii</i> (Lacepede) Common White Sucker	Abundant	Abundant	Recorded as <i>Catostomus teres</i> (Mitchill)	Uncommon or common	Very common or abundant	Uncommon or common	Very common or abundant	More numerous in undredged localities; recorded from every undredged locality
<i>Hypentelium nigricans</i> (Le Sueur) Hog Molly			Recorded as <i>Catostomus nigricans</i> Le Sueur	Usually uncommon; sometimes common where there is considerable sand and gravel	Usually common or abundant on sand and gravel riffles			Increase in amount of sand and gravel probably caused increase in fish numbers
<i>Erimyzon oblongus claviformis</i> (Girard) Western Creek Sucker	Scarce	Scarce	Recorded as <i>Erimyzon sucetta</i> (Lacepede)	Scarce	More numerous than in dredged portions	Scarce	Scarce	As elsewhere in western Ohio, this prairie-stream species may migrate up these creeks in large numbers in early spring to spawn.
<i>Mintytrema melanoψs</i> (Rafinesque) Spotted Sucker					1 subadult			Usually occurs in numbers in deep pools of fair-sized streams and not in small creeks such as these
<i>Moxostoma duquesnii</i> (Le Sueur) Black Mullet	Abundant	Abundant	Meek's <i>M. duquesnii</i> was presumably a composite of this and the two following					If this species of deep clear water occurs at present, it must be very rare

Table I—(Continued)

SPECIES	1887 (Meek)			1938 (Trautman)				
	LOST CREEK (Undredged)	GORDON CREEK (Undredged)	REMARKS	LOST CREEK		GORDON CREEK		REMARKS
				Dredged	Undredged	Dredged	Undredged	
<i>Moxostoma erythrum</i> (Rafinesque) Golden Mullet			Presumably the most numerous <i>Moxostoma</i> in 1887			Young numerous in 1930	Since this sucker is chiefly an inhabitant of gravelly riffles and deep pools of clear streams, it may have been more numerous in 1887 than at present	
<i>Moxostoma rubreques</i> Hubbs Greater Redhorse			Probably present but confused with <i>M. duquesnii</i>		1 specimen	1 specimen	Like the preceding, this species is numerous in the Maumee River at the mouth of Gordon Creek	
<i>Cyprinus carpio</i> Linnaeus Carp			First introduced into Great Lakes waters of Ohio in 1879 (Cole, 1905; 547); probably very local in distribution in 1887		1 small young	A few young taken in a deep pool		
<i>Nocomis biguttatus</i> (Kirtland) Horny-headed Chub	Abundant	Abundant	Recorded as <i>Hybopsis kentuckiensis</i> ; may have included some <i>Nocomis micropogon</i> (Cope)		Abundant		Abundant in undredged portions of Lost Creek where there was some rooted aquatic vegetation	
<i>Rhinichthys atratulus meleagris</i> Agassiz Western Black-nosed Dace	Not abundant		Recorded as <i>Rhinichthys atronasus</i>		Abundant in spring-fed headwaters that flow from a large moraine		Apparently a relict which has remained in the spring-fed headwaters	
<i>Semotilus atromaculatus atromaculatus</i> (Mitchill) Northern Creek Chub	Abundant	Abundant		Common	Abundant	Uncommon	Common	Most numerous in small undredged waters having well-defined riffles and pools

<i>Notropis volucellus volucellus</i> (Cope) Northern Mimic Shiner		Not very abundant	Recorded as <i>Notropis volucella</i> . Meek was one of the first ichthyologists to separate this species from <i>Notropis deliciosus</i> .					Probably still occurs sparingly in the deeper pools. Numerous in Maumee River near mouth of Lost Creek.
<i>Notropis deliciosus stramineus</i> (Cope) Northern Sand Shiner			Recorded by Meek in Maumee River. From Meek's writings (1889: 436-437) it is apparent that he could correctly identify this species	Common in sandy portions downstream; not in small headwaters		Uncommon; present only near mouth and over a sandy bottom		Probably has increased greatly in numbers since 1887 because of increase in amount of sand and suitable habitat
<i>Notropis spilopterus</i> (Cope) Northern Steel-colored Shiner	Not abundant		Recorded as <i>Notropis whipplei</i>	Very common or abundant		A few	A few	Not numerous in headwaters; a species tolerant of roily water.
<i>Notropis cornutus</i> (Mitchill) Common Shiner	Very abundant	Very abundant	Recorded as <i>Notropis megalops</i> (Rafinesque)	Abundant	Abundant	Common	Uncommon	Headwaters apparently contain typical <i>N. cornutus frontalis</i> (Agassiz). Downstream portions contain varying percentages of <i>frontalis</i> and intergrades between <i>frontalis</i> and <i>chrysocephalus</i> (Rafinesque)
<i>Notropis umbratilis cyanocephalus</i> (Copeland) Northern Red-finned Shiner	Scarce	Scarce	Recorded as <i>Notropis lythurus</i> Jordan and Gilbert		Scarce or uncommon		Scarce or uncommon	A pool species not tolerant to recent dredging
<i>Ericymba buccata</i> Cope Silver-jawed Minnow	Very abundant	Much less abundant than in Lost Creek		Abundant, especially over a sandy bottom	Usually absent or scarce, abundant only over sandy bottom	Abundant wherever sand is exposed	Usually absent or scarce; present in numbers only over sandy bottom	Dredging with resultant increase of sand apparently resulted in increased numbers of fish
<i>Phenacobius mirabilis</i> (Girard) Sucker-mouthed Minnow			Not recorded by Kirsch (1895)	Uncommon, common or abundant	2 specimens	Rare or uncommon		Apparently a recent invader and one tolerant to turbid water

Table I—(Continued)

SPECIES	1887 (Meek)			1938 (Trautman)				
	LOST CREEK (Undredged)	GORDON CREEK (Undredged)	REMARKS	LOST CREEK		GORDON CREEK		REMARKS
				Dredged	Undredged	Dredged	Undredged	
<i>Notemigonus crysoleucas curatus</i> Rafinesque Golden Shiner			Recorded as <i>Notemigonus crysoleucas</i>		Rare, only in weedy pools		Rare, only in ox-bows or weedy pools	
<i>Chrosomus erythrogaster</i> Rafinesque Southern Red-bellied Dace	Scarce		May have been <i>C. eos</i> instead of <i>C. erythrogaster</i> . See p. 279 and footnote No. 7					A relict in this section of Ohio; may now be extirpated
<i>Etheorhynchus notatus</i> (Rafinesque) Blunt-nosed Minnow	More abundant than <i>Pimephales p. promelas</i>	More abundant than <i>Pimephales p. promelas</i>	Recorded as <i>Pimephales notatus</i>	Generally distributed, usually uncommon, only abundant in one locality	Generally distributed, usually common	Generally distributed, usually uncommon	Generally distributed, usually common	Averaging less numerous than <i>Pimephales p. promelas</i> and markedly so in dredged portions
<i>Pimephales promelas promelas</i> Rafinesque Northern Fat-headed Minnow	Not abundant	Not abundant	Its scarcity as indicated by Kirsch (1895: 328) suggests that this essentially prairie-stream fish was less common in the Ohio section of the Maumee drainage before 1900 than after 1930 (Trautman: records unpublished)	Common or abundant in all sections except those most devoid of cover	Common or abundant	Common or abundant	Common or abundant	This inhabitant of prairie-like and rocky streams has probably increased greatly throughout northwestern Ohio in recent years
<i>Camptostoma anomalum pullum</i> (Agassiz) Mississippi Tallow-mouthed Minnow		Not very abundant	Recorded as <i>Camptostoma anomalum</i> (Rafinesque)	A few	Uncommon, common or abundant; found at all stations		1 specimen	

<i>Ameiurus melas melas</i> (Rafinesque) Northern Black Bullhead	Abundant	Abundant	Recorded as <i>Ameiurus melas</i>		Uncommon, common or abundant	1 specimen	Uncommon or common	Habitat destroyed by dredging
<i>Ameiurus nebulosus nebulosus</i> (Le Sueur) Northern Brown Bullhead	Very abundant	Very abundant	Recorded as <i>Ameiurus nebu- losus</i> ; almost unquestionably misidentified; must have been <i>Ameiurus natalis</i> since <i>nebulosus</i> is a deep-water inhabitant					
<i>Ameiurus natalis natalis</i> (Le Sueur) Northern Yellow Bullhead					Usually common or abundant in pools and especially those contain- ing aquatic vegetation	2 specimens, 1 found hiding under old shoe, other under brick	Usually common in pools, abundant in ox-bows	Habitat destroyed by dredging
<i>Schilbeodes gryinus gryinus</i> (Mitchill) Tadpole Madtom					1 in weedy pool		2 in weedy ox-bow	
<i>Umbra limi</i> (Kirtland) Western Mudminnow	Rather common in small bayous	Rather common in small bayous			Still fairly common in undisturbed weedy head- water pools			Habitat destroyed by dredging
<i>Esox vermiculatus</i> Le Sueur Mud Pickerel	Not very abundant	Not very abundant	Recorded as <i>Lucius vermiculatus</i>					This inhabitant of weedy bayous may still be present in small numbers in un- dredged portions
<i>Fundulus notatus notatus</i> (Rafinesque) Black-striped Topminnow						2 specimens in 1 collection	Common in undredged ox-bow	
<i>Aphredoderus sayanus</i> (Gilliams) Pirate-Perch		One small specimen taken	Supposed to have been given to U.S. National Museum; catalogued as No. 40104; see footnote No. 7					This relict species has probably been extirpated because of destruction of its habitat
<i>Hadropterus maculatus</i> (Girard) Black-sided Darter	Not abundant	Not abundant	Recorded as <i>Eltheostoma aspro</i> (Cope and Jordan)		A few		A few	Inhabitant of the larger- undredged pools that con- tain a moderate flow of water

Table I—(Continued)

SPECIES	1887 (Meek)			1938 (Trautman)				
	LOST CREEK (Undredged)	GORDON CREEK (Undredged)	REMARKS	LOST CREEK		GORDON CREEK		REMARKS
				Dredged	Undredged	Dredged	Undredged	
<i>Boleosoma nigrum nigrum</i> (Rafinesque) Western Johnny Darter	Abundant	Abundant	Recorded as <i>Etheostoma</i> <i>nigrum</i> Rafinesque	Uncommon generally; rare in recently, dredged portions	Common or abundant in gravelly riffles and pools	A few	Common where there is gravel	A marked paucity only in most recently dredged portions
<i>Poeciliichthys spectabilis</i> Agassiz Orange-throated Darter	One specimen?		The <i>Etheostoma</i> <i>coeruleum</i> Storer of Meek was either <i>P. coeruleus</i> or <i>P. spectabilis</i>	Uncommon	Common or abundant in undisturbed portions			A prairie-stream species; may have invaded Lost Creek with the draining of Black Swamp
<i>Etheostoma blennioides</i> <i>blennioides</i> Rafinesque Northern Green-sided Darter					Rare or uncommon, usually frequenting the faster, larger riffles		Rare	Probably a recent invader
<i>Lepomis cyanellus</i> Rafinesque Green Sunfish	Abundant	Abundant		A few	Usually common; sometimes abundant	A few	Usually common, abundant in ox-bows	Most numerous in well- defined pools and ox-bows
<i>Lepomis megalotis</i> (Rafinesque) Long-eared Sunfish	Less abundant than <i>Lepomis</i> <i>cyanellus</i>		Meek probably had <i>L. m. pel-</i> <i>tastes</i> (Cope) the form most numer- ous in the Maumee drainage					Recent collecting indi- cates that this species is less widespread and less numerous in Ohio section of Maumee drainage than it was in 1893 (Kirsch, 1895: 331)
<i>Pomoxis annularis</i> (Rafinesque) White Crappie					Sixteen speci- mens, all from deep holes		A few	Both creeks have been repeatedly stocked with this species
<i>Cottus bairdii bairdii</i> Girard Northern Muddler				Rare, usually absent	Abundant in the small streams con- taining many springs; uncommon in Lost Creek proper			A relict in clear, small brooks; has been recorded only once before in Ohio section of the Maumee drainage (Kirsch, 1895: 332)