An Annotated List of the Fishes of the Western Basin of Lake Erie with Emphasis on the Bass Islands and Adjacent Tributaries

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ABSTRACT. Fish assemblage structure has changed dramatically in the Western Basin of Lake Erie since Trautman's revision of the Fishes of Ohio. Fish surveys near the Bass Islands and adjacent mainland tributaries documented fish faunal distributional patterns during the last three decades. Collections (n = 1942 sites) from 1980–2015 indicate 120 extant fish species and 19 extirpated species from the Bass Islands and nearby tributaries to the Western Basin. Extirpation of *Polyodon spatula, Alosa sapidissima, Moxostoma lacerum*, and *Sander glacum* occurred; however, *Acipenser sapidissima* and members of genus *Oncorhynchus* were introduced but unable to naturalize. Recent collection of rare species included *A. fulvescens* in Schoolhouse Bay near Middle Bass Island in May 2012; *Umbra limi* populations on Middle Bass Island and Kelley's Island; and *Lepisosteus oculatus* populations along the southeastern shoreline of North Bass Island are stable in Lake Erie despite cultural eutrophication. The current Western Basin fish assemblage includes 101 native, 12 nonindigenous, and seven alien fish species. Fourteen native species have been extirpated from the Western Basin of Lake Erie, while six nonindigenous species have not naturalized and have been extirpated. Introduced nonindigenous and alien species are responsible for increased species richness including *Neogobius melanostomus, Proterorhinus semilunaris, Salmo trutta, Carassius auratus, Cyprinus carpio, Ctenopharyngodon idella* and three records for *Hypophthalmichthys nobilis* since 1995. *Hypophthalmichthys molitrix* has never been collected but eDNA testing has indicated its presence. Neither *H. nobilis* or *H. molitrix* are considered established in Lake Erie, while *Ctenopharyngodon idella* may be reproducing within the basin. Brief comments on distribution, relative abundance, and status are provided for each species.

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INTRODUCTION

Many factors have contributed to impacts on Great Lakes fishes, including cultural eutrophication, contamination, and the introduction of nonindigenous and alien species that has contributed to the extinction of numerous native species (Mills et al. 1993; MacIsaac et al.2001; Ricciardi 2006). Invading species have bypassed the natural barriers of Niagara Falls with the opening of canals and waterways that enabled nonindigenous Atlantic slope species to enter Lake Erie (Daniels 2001). International shipping ports have provided beach heads for colonization of alien species and served as transoceanic dispersal routes of species into American ports from ballast water (Fuller et al. 1999; MacIssac 1999; Ricciardi 2001). In addition, the accidental escape of species from flooded aquaculture facilities has jeopardized the structure and function of the Great Lakes ecosystem with the potential dispersal of Asian carp through connections with the Mississippi River (Mills et al.1993; Fuller et al.1999).

At one time, Lake Erie possessed the highest species richness of fish of any Great Lake (Underhill 1986). The shallow, warm waters are conducive to a variety of colonizing species and provide a diversity of habitats which contribute to its high productivity. In Trautman's (1957, 1981) classic work on the Fishes of Ohio, he chronicled the demise and changing fish assemblage of Lake Erie in the vicinity of the Bass Islands during 1955–1980. Based on these accounts there is considerable evidence that the basin did not begin to change significantly until the middle of the 20th century (Trautman 1981). As a result of the alteration of coastal shoreline processes and the increased nutrient loading with intensive changing land use practices, (Trautman 1981; Underhill 1986), these basin–wide changes caused major modifications in the fish fauna. Trautman (1981) reported that by the late 1960s, several species of fish had been extirpated from the lake or from its tributaries. Van Meter and

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Trautman (1970) reported that more than 35 species of food fishes of significant commercial importance in Lake Erie had decreased to such an extent that they were of little or no economic value to commercial fisheries by 1970. On the other hand, other species of lesser importance have increased in numbers because of the extensive changes including alien species such as the Black and Caspian Sea Gobiidae.

The sequence of events that transpired regarding the Lake Erie fish fauna during the last three decades required documentation to chronicle changes since Trautman's (1981) work. A significant amount of sampling has occurred since 1980 including surveys of the Portage (OEPA 1995a, 2010a), Maumee (OEPA 2010a), St. Joseph (OEPA 1994a, unpublished 2013 and 2015 data), St. Mary's (OEPA 1992a, unpublished 2015 data), Sandusky (OEPA 1991, 2000a, 2003a, 2010b, 2011), Blanchard (OEPA 2007a), East Fork Vermilion (OEPA 2008), Ottawa (OEPA 1998, 2000b, 2003c, 2007b, 2013), Tiffin (OEPA 1993, unpublished 2013 data), Toussaint (OEPA 2005a), and Vermilion (OEPA 2004) rivers. The Miami–Erie Canal (2012b), select tributaries of Lake Erie (OEPA 2004, 2010a), and estuaries such as Old Woman Creek (OEPA 2004) and Sandusky Bay (OEPA 2010b) were investigated. Tributary sampling included investigations of Swan Creek (OEPA 2009), Fish Creek (OEPA 1994b, 1995b, 1996, 2003b, 2005b), Loss Creek (OEPA 2012a), Riley and Little Riley Creek (OEPA 1992b), Armstrong Creek (2012b), and Chappel, Sugar, and Old Woman Creek (OEPA 2004, unpublished data 2015). Due to the ecological importance of Lake Erie, it is important to publish an updated annotated list of the lake's fishes. Historically, a total of 141 species of fishes are known (Dymond 1922; Fish 1932; Greeley 1929; Hubbs 1926; Hubbs and Brown 1929; Trautman 1935, 1957, 1981; MacKay 1963; Nelson and Gerking 1968; Scott 1967; Underhill 1986; Hubbs et al. 2004; Simon 2011), and where appropriate, comments on present and past distribution, abundance, and conservation status are provided in addition to present range for all previously known species in the Western Basin of Lake Erie and tributaries.

STUDY AREA

The Lake Erie Basin lies in the lacustrine plain of three physiographic sections including the Till Plains, Lake Plains, and Glaciated Plateau (Trautman 1981). The basin encompasses about 8936 km^2 in Lake Erie, including the Maumee and Sandusky bays and adjacent tributaries draining from southeastern Michigan and northwestern Ohio (Figure 1). Tributary streams include the Bear Creek, Ottawa River, Maumee River, Crane Creek, Turtle Creek, Toussaint Creek, Portage River, Big Muddy Creek, Sandusky River, Cold Creek, Huron River, and Vermillion River. Drowned river mouth coastal wetlands associated with the coastal shoreline in the Western Basin are typically separated from Lake Erie along most of the Western Basin by a series of dikes and control structures, but some natural connections remain within the Sandusky and Maumee Bays. The current study includes all drowned river lacustrine and freshwater tributaries draining into Lake Erie that have been historically sampled from the mouth of the Detroit River in Michigan southeastward to the Vermillion River basin in Ohio.

METHODS

The annotated species information is based on 148 estuary, 1,509 tributary, and 62 Lake Erie coastal, island, and open water sites, comprising nearly 59,758 records. This study is based on collections of 1,654,782 individuals that have been collected from 1980–2014. Sampling methods included a variety of gears appropriate for the habitat type under consideration; however, unpublished records from the Franz Theodore Stone Laboratory included information gathered by ichthyologists from other institutions during teaching and research activities at The Ohio State University. Collections described herein were made for many purposes and used a variety of gear types, ranging from seines to various forms of electrofishing equipment. Representative sampling included all habitats in the stream or lake reach being investigated relative to habitat occurrence using various sized seines or a Smith–Root Model 12–B® battery powered backpack electrofishing unit, longline or tote barge wading electrofishing systems powered by a Baldore (formerly T&J) 1750 watt, three-phase, bridge rectified, 250 volt pulsed DC electrofishing unit, Smith-Root DC generator mounted 5000 watt boat VVP electrofishing in drowned river mouth wetlands and Lake Erie coastal habitats, and deepwater otter trawls in open water, and beach seines along wadeable areas of Lake Erie. Ohio EPA follows consistent sampling methods (OEPA 1987a, b) that have been used consistently during the sampling period.

All large fish specimens were identified in the field and released, but voucher specimens were retained from each site. Each species' relative abundance was

recorded in approximate proportion to abundance. Relative abundance information is defined by Smith (1965), Burr and Warren (1986), and Simon et al. (2002) and ranges in increasing order include: rare, sporadic, occasional, common, and abundant. Conservation status refers to current status based on stable, imperiled, or invasive species designations as to population declining or expanding within range over the period 1980–2014. Records for *Hypophthalmichthys molatrix, Oncorhynchus* species, and *Ctenopharyngodon*

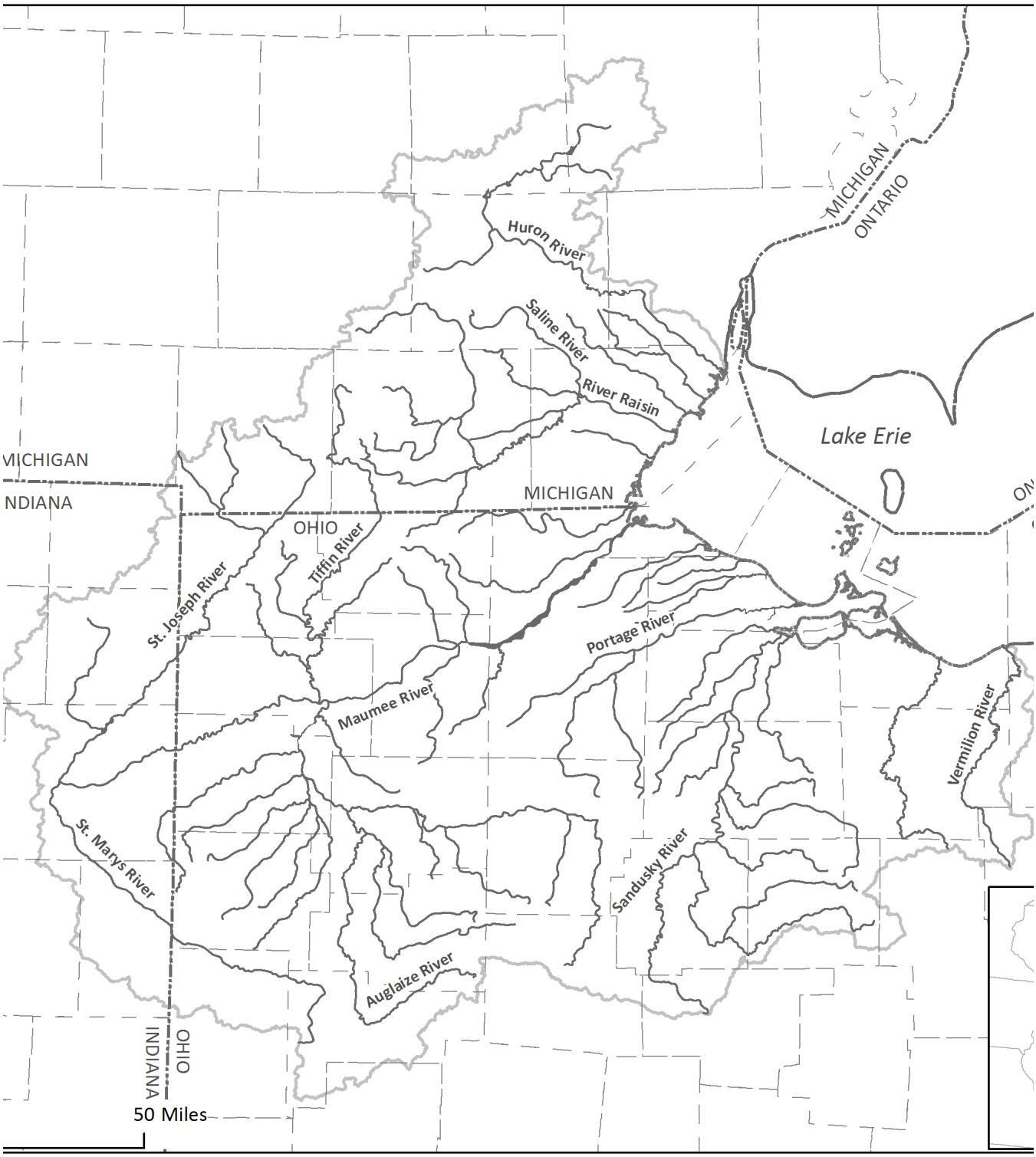

FIGURE 1. Study area showing the Bass Islands and tributaries associated with the Western Basin of Lake Erie (modified from USGS National Water Quality Assessment Program Lake Erie-Lake St. Clair base map).

idella, do not have specific locations but are based on literature and unpublished information. Retained specimens were preserved in 10 percent formalin and transferred to 70 percent ethanol and identified using Trautman (1981), Hubbs et al. (2004), and Simon (2011).

In the species accounts, species are designated as native (N), introduced nonindigenous species (I), and alien (E). Native species are defined as occurring within its original distributional range and would occur naturally in Lake Erie. Nonindigenous species would include species that enter a body of water or aquatic ecosystem outside of its historic or native range, i.e., basins outside of Lake Erie. An alien species is synonymous with "exotic" and is defined as a species living outside its native distributional range from either deliberate or accidental human introduction, i.e., areas external to North America (Courtney and Stauffer 1984).

Species are arranged in phylogenetic order by family and alphabetically by species within family. Scientific names are based on the Integrated Taxonomic Information System (ITIS), which is the most authoritative taxonomic information on organisms of North America and globally. It is updated regularly (ITIS 2015) and incorporates validated and recognized taxonomic information. Subspecific names were included only when it was believed that their inclusion was justified and when there was reasonable evidence (based on preserved material) that they were truly subspecies in Lake Erie. Species that lack factual records, i.e., without voucher specimens, were not included in this list.

Materials examined for the current study are not comprehensive, but represent the vouchered holdings of the F.T. Stone Laboratory on Gibraltar Island, The Ohio State University island campus. This compilation of information is based on the collective efforts of a number of ichthyologists including C. Levitt Smith (CLS), New York State Museum; Ted Cavender (TC), Museum of Biodiversity at The Ohio State University; and Timothy Berra (TB), The Ohio State University. The Ohio Environmental Protection Agency's extensive database was included for tributary, coastal shoreline of Lake Erie, and estuary records from biological assessments. All voucher specimens are cataloged into permanent research collections. Lake vouchers are curated at the Franz T. Stone Laboratory (OSUS) and stream and tributary specimens in the Museum of Biodiversity (OSUM). Extensive data collection records are maintained by Ohio Environmental Protection Agency, Ecological Assessment Section, Columbus. Indiana records are maintained by the Aquatic Research Center, Indiana Biological Survey (INBS), Bloomington, Indiana, and Michigan records by the University of Michigan Museum of Zoology (UMMZ).

RESULTS AND DISCUSSION

Drainage Diversity

The present faunal list for the Western Basin of Lake Erie includes 139 species from the Bass Island and nearby Western Basin tributaries. Range extensions, invasive species colonization, and extirpations have influenced the previously known distribution information for the Western Basin since Trautman's (1981) monumental work on Ohio fishes. Collections (n = 1942 sites) from 1980–2015 indicate 120 extant fish species and 19 extirpated species from the Bass Islands and nearby tributaries to the Western Basin (Table 1, Appendix 1). Extirpation of *Polyodon spatula, Alosa sapidissima, Moxostoma lacerum*, and *Sander glacum* occurred; however, *A. sapidissima* and members of genus *Oncorhynchus* were introduced but unable to naturalize.

Recent collection of rare species included *A. fulvescens* in Schoolhouse Bay near Middle Bass Island in May 2012; *Umbra limi* populations on Middle Bass Island and Kelley's Island; and *Lepisosteus oculatus* populations along the southeastern shoreline of North Bass Island are stable in Lake Erie despite cultural eutrophication. The current Western Basin fish assemblage includes 101 native, 12 nonindigenous, and seven alien fish species. Fourteen native species have been extirpated from the Western Basin of Lake Erie, while six nonindigenous species have not naturalized and have been extirpated. Introduced nonindigenous and alien species are responsible for increased species richness including *Neogobius melanostomus, Proterorhinus semilunaris, Salmo trutta, Carassius auratus, Cyprinus carpio*, *Ctenopharyngodon idella* and three records for *Hypophthalmichthys nobilis* since 1995. *Hypophthalmichthys molitrix* has never been collected but eDNA testing has indicated its presence. Neither *H. nobilis* or *H. molitrix* are considered established in Lake Erie, while *Ctenopharyngodon idella* may be reproducing within the basin. Brief comments on distribution, relative abundance, and status are provided for each species.

Table 1
Checklist of species from the Western Basin of Lake Erie including taxonomic nomenclature, common name and status. N = native, E = exotic, I = non-indigenous

Family	Species
Petromyzontidae	*Ichthyomyzon unicuspis* Hubbes and Trautman -- Silver Lamprey (N) *Ichthyomyzon fossor* Reighard and Cummins -- Northern Brook Lamprey (N) *Lethenteron appendix* (DeKay) -- American Brook Lamprey (N) *Petromyzon marinus* Linnaeus -- Sea Lamprey (I)
Acipenseridae	*Acipenser fulvescens* Rafinesque -- Lake Sturgeon (N)
Polyodontidae	*Polyodon spathula* (Walbaum) -- Paddlefish (N)
Lepisosteidae	*Lepisosteus oculatus* (Winchell) -- Spotted Gar (N) *Lepisosteus osseus* (Linnaeus) -- Longnose Gar (N)
Amiidae	*Amia calva* Linnaeus -- Bowfin (N)
Hiodontidae	*Hiodon tergisus* Lesueur -- Mooneye (N)
Clupeidae	*Alosa pseudoharengus* (Wilson) -- Alewife (I) *Alosa sapidissima* (Wilson) -- American Shad (I) *Dorosoma cepedianum* (Lesueur) -- Gizzard Shad (N)
Salmonidae	*Oncorhynchus kisutch* (Walbaum) -- Coho Salmon (I) *Oncorhynchus mykiss* Richardson -- Rainbow Trout (I) *Oncorhynchus tshawytscha* (Walbaum) -- Chinook Salmon (I) *Salmo salar* Linnaeus -- Atlantic Salmon (I) *Salmo trutta* Linnaeus -- Brown Trout (I/E) *Salvelinus fontinalis* (Mitchill) -- Brook Trout (N) *Salvelinus namaycush* (Walbaum) -- Lake Trout (N) *Coregonus artedi* Lesueur -- Cisco or Lake Herring (N) *Coregonus clupeaformis* (Mitchill) -- Lake Whitefish (N)
Osmeridae	*Osmerus m. mordax* (Mitchill) -- Rainbow Smelt (I)
Umbridae	*Umbra limi* (Kirtland) -- Central Mudminnow (N)
Esocidae	*Esox americanus vermiculatus* Lesueur -- Grass Pickerel (N) *Esox lucius* Linnaeus -- Northern Pike (N) *Esox masquinongy* Mitchill -- Muskellunge (N)
Cyprinidae	*Campostoma a.anomalum* (Rafinesque) -- Common Stoneroller (N) *Campostoma anomalum pullum* (Agassiz) -- Central Stoneroller (N) *Carassius auratus* (Linnaeus) -- Goldfish (E) *Chrosomus eos* Cope -- Northern Redbelly Dace (N) *Chrosomus erythrogaster* (Rafinesque) -- Southern Redbelly Dace (N)

Table 1 (cont.)
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Family	Species
	Clinostomus elongatus (Kirtland) -- Redside Dace (N)
	Ctenopharyngodon idella (Valenciennes in Cuvier and Valenciennes, 1844) -- Grass Carp (E)
	Cyprinella spilopterus (Cope) -- Spotfin Shiner (N)
	Cyprinus carpio Linnaeus -- Common Carp (E)
	Hybognathus hankinsoni Hubbs 1929 -- Brassy Minnow (I)
	Hybopsis a. amblops (Rafinesque) -- Bigeye Chub (N)
	Hypophthalmichthys molitrix (Valenciennes in Cuvier and Valenciennes) -- Silver Carp (E)
	Hypophthalmichthys nobilis (Richardson) -- Bighead Carp (E)
	Luxilus chrysocephalus (Rafinesque) -- Striped Shiner (N)
	Luxilus cornutus frontalis (Mitchill) -- Northern Common Shiner (N)
	Lythrurus umbratilis cyanocephalus (Copeland) -- Redfin Shiner (N)
	Macrhybopsis storeriana (Kirtland) -- Silver Chub (N)
	Nocomus biguttatus (Kirtland) -- Hornyhead Chub (N)
	Nocomis micropogon (Cope) -- River Chub (N)
	Notropis anogenus Forbes -- Pugnose Shiner (N)
	Notropis ariommus (Cope) -- Popeye Shiner (N)
	Notropis atherinoides Rafinesque -- Emerald Shiner (N)
	Notropis boops Gilbert -- Bigeye Shiner (N)
	Notropis buccatus Cope -- Silverjaw Minnow (N)
	Notropis buchanani Meek -- Ghost Shiner (N)
	Notropis heterodon (Cope) -- Blackchin Shiner (N)
	Notropis heterolepis Eigenmann and Eigenmann -- Blacknose Shiner (N)
	Notropis hudsonius (Clinton) -- Spottail Shiner (N)
	Notropis photogenis (Cope) -- Silver Shiner (N)
	Notropis rubellus (Agassiz) -- Rosyface Shiner (N)
	Notropis stramineus (Cope) -- Sand Shiner (N)
	Notropis v. volucellus (Cope) -- Mimic Shiner (N)
	Notemigonus crysoleucas (Mitchill) -- Golden Shiner (N)
	Opsopoeodus emiliae Hay -- Pugnose Minnow (N)
	Phenacobius mirabilis (Girard) -- Suckermouth Minnow (I)
	Pimephales p. promelas Rafinesque -- Fathead Minnow (N)
	Pimephales notatus (Rafinesque) -- Bluntnose Minnow (N)
	Pimephales vigilax (Baird and Girard) -- Bullhead Minnow (I)
	Rhinichthys cataractae (Valenciennes) -- Longnose Dace (N)
	Rhinichthys obtusus Agassiz -- Western Blacknose Dace (N)
	Scardinius erythrophthalmus (Linnaeus) -- Rudd (E)
	Semotilus atromaculatus (Mitchill) -- Creek Chub (N)
Catostomidae	*Carpiodes carpio* (Rafinesque) -- River Carpsucker (I)
	Carpiodes cyprinus (Lesueur) -- Quillback (N)
	Catostomus catostomus (Forster) -- Longnose Sucker (N)
	Catostomus commersonii (Lacepède) -- White Sucker (N)
	Erimyzon claviformis (Girard) -- Creek Chubsucker (N)

Table 1 (cont.)
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Family	Species
	Erimyzon sucetta (Girard) -- Lake Chubsucker (N)
	Hypentelium nigricans (Lesueur) -- NorthernHogsucker (N)
	Ictiobus bubalus (Rafinesque) -- Smallmouth Buffalo (N)
	Ictiobus cyprinellus (Valenciennes) -- Bigmouth Buffalo (N)
	Minytrema melanops (Rafinesque) -- Spotted Sucker (N)
	Moxostoma anisurum (Rafinesque) -- Silver Redhorse (N)
	Moxostoma carinatum (Cope) -- River Redhorse (I)
	Moxostoma duquesnei (Lesueur) -- Black Redhorse(N)
	Moxostoma erythrurum (Rafinesque) -- Golden Redhorse (N)
	Moxostoma lacerum Jordan and Brayton -- Harelip Sucker (N)
	Moxostoma macrolepidotum (Lesueur) -- Shorthead Redhorse (N)
	Moxostoma valenciennesi Jordan -- Greater Redhorse (N)
Ictaluridae	*Ameiurus catus* (Linnaeus) -- White Catfish (I)
	Ameiurus melas (Rafinesque) -- Black Bullhead (N)
	Ameiurus natalis (Lesueur) -- Yellow Bullhead (N)
	Ameriurus nebulosus (Lesueur) -- Brown Bullhead (N)
	Ictalurus punctatus (Rafinesque) --Channel Catfish (N)
	Noturus flavus Rafinesque -- Stonecat (N)
	Noturus gyrinus (Mitchill) -- Tadpole Madtom (N)
	Noturus miurus Jordan -- Brindled Madtom (N)
	Noturus stigmosus Taylor -- Northern Madtom (N)
	Pylodictis olivaris (Rafinesque) -- Flathead Catfish (I)
Anguillidae	*Anguilla rostrata* (Lesueur) -- American Eel (N)
Fundulidae	*Fundulus diaphanus menona* Jordan and Copeland -- Western Banded Killifish (N)
	Fundulus notatus (Rafinesque) -- Blackstripe Topminnow (N)
Poeciliidae	*Gambusia affinis* (Baird and Girard) -- Western Mosquitofish (I)
Gadidae	*Lota lota* (Linnaeus) -- Burbot (N)
Gasterosteidae	*Culaea inconstans* (Kirtland) -- Brook Stickleback (N)
	Gasterosteus aculeatus Girard -- Threespine Stickleback (I)
Atherinopsidae	*Labidesthes sicculus* (Cope) -- Brook Silverside (N)
Percopsidae	*Percopsis omiscomaycus* (Walbaum) -- Trout-perch (N)
Aphredoderidae	*Aphredoderus sayanus* (Gilliams) -- Pirate Perch (N)
Moronidae	*Morone americana* (Gmelin) -- White Perch (I)

Table 1 (cont.)
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Family	Species
	Morone chrysops (Rafinesque) -- White Bass (N)
Centrarchidae	*Ambloplites rupestris* (Rafinesque) -- Rock Bass (N)
	Lepomis cyanellus Rafinesque -- Green Sunfish (N)
	Lepomis gibbosus (Linnaeus) -- Pumpkinseed (N)
	Lepomis gulosus (Cuvier) -- Warmouth (N)
	Lepomis humilis (Girard) -- Orangespotted Sunfish (I)
	Lepomis macrochirus Rafinesque -- Bluegill (N)
	Lepomis microlophus (Gunther) -- Redear Sunfish (I)
	Lepomis peltastes Cope -- Northern Longear Sunfish (N)
	Micropterus dolomieu Lacepède -- Smallmouth Bass (N)
	Micropterus salmoides Lacepède -- Largemouth Bass (N)
	Pomoxis annularis Rafinesque -- White Crappie (N)
	Pomoxis nigromaculatus (Lesueur) -- Black Crappie (N)
Percidae	*Sander canadensis* (Griffith and Smith) -- Sauger (N)
	Sander vitreus (Mitchill) -- Walleye (N)
	Perca flavescens (Mitchill) -- Yellow Perch (N)
	Ammocrypta pellucida (Putnam) -- Eastern Sand Darter (N)
	Etheostoma blennioides pholidotum Rafinesque -- Prairie Darter (N)
	Etheostoma caeruleum Storer -- Rainbow Darter (N)
	Etheostoma exile (Girard) -- Iowa Darter (N)
	Etheostoma flabellare Rafinesque -- Fantail Darter (N)
	Etheostoma microperca Jordan and Gilbert -- Least Darter (N)
	Etheostoma nigrum eulepis (Hubbs and Greene) -- Scaly Darter (N)
	Etheostoma n. nigrum Rafinesque -- Johnny Darter (N)
	Etheostoma spectabile (Agassiz) -- Orangethroat Darter (N)
	Percina caprodes (Rafinesque) -- Logperch (N)
	Percina copelandi (Jordan) -- Channel Darter (N)
	Percina evides (Jordan and Copeland) -- Gilt Darter (N)
	Percina maculata (Girard) -- Blackside Darter (N)
	Percina sciera (Swain) -- Dusky Darter (I)
	Percina shumardi (Girard) -- River Darter (N)
Sciaenidae	*Aplodinotus grunniens* Rafinesque -- Freshwater Drum (N)
Cottidae	*Cottus bairdii* Girard -- Mottled Sculpin (N)
	Cottus ricei (Nelson) -- Spoonhead Sculpin (N)
Gobiidae	*Neogobius melanostomus* (Pallus) -- Round Goby (E)
	Proterorhinus semilunaris (Heckel) -- Tubenose Goby (E)

Historical Assemblage and Range Extensions

Trautman (1981) chronicled the sequence of events that transpired regarding the Lake Erie fish fauna from 1801 to 1980. He reported that a total of 122 species and seven additional subspecies were listed as occurring during the period from 1750 and 1950. Trautman (1981) indicted that the species richness of Lake Erie and its connecting bays and harbors included 93 species and six additional subspecies. The greatest richness was attributed to the Maumee River that included 93 species and two subspecies.

Trautman (1981) reported that 2500 localities were collected from 1840 to 1950. A significant amount of sampling has occurred since 1980 with nearly 1,942 sites sampled with more than 2,500 collections from those sites. Our inventories increased the cumulative list of species found in the Western Basin of Lake Erie from Ohio, Michigan, and Indiana by 21 species. Many of the added species are nonindigenous, alien, or rare species experiencing range resurgence. Introduced species such as *Neogobius melanostomus* and *Proterorhinus semilunaris* first appeared in the drainage after 1993, while Asian carps such as *Hypopthalmichthys nobilis* were found in 2000 and *Ctenopharyngodon idella* since 2009, have been reported from Sandusky Bay, Cedar Point, and elsewhere by eDNA (Great Lakes Fishery Commission-Lake Erie Committee 2015). Taxonomic changes and anthropogenic range extensions have accounted for increased species richness, especially with the stocking of salmon genera including *Oncorhynchus* and *Salmo*, *Osmerus m. mordax*, *Pylodictis olivaris*, and *Ctenophyngodon idella*. In addition, minnow, sunfish, and darter species have been elevated from subspecies to full species since Trautman (1981). Taxonomic recognition of *Campostoma a. anomalum, C. a. pullum*, *Lepomis peltastes*, *Etheostoma blennioides pholidotum*, and *E. nigrum eulepis* have been elevated from synonymy with former species complexes (Hubbs et al. 2004; Simon 2011). Five range extensions within the drainage were found based on a more comprehensive sampling effort. New localities for *Notropis buchanani, Fundulus diaphanus menona, Aphredoderus sayanus, Ammocrypta pellucida*, and *Percina sciera* have been recorded from the Western basin.

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