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An Annotated Bibliography of the chain pickerel, *Esox niger* (Osteichthyes: Salmoniformes)

E. J. Crossman and G. E. Lewis

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LIFE SCIENCES

MISCELLANEOUS PUBLICATION

E. J. CROSSMAN
AND G. E. LEWIS

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An Annotated Bibliography of the chain pickerel, *Esox niger* (Osteichthyes: Salmoniformes)

Introduction

The chain pickerel, *Esox niger* Lesueur, is the fourth largest of the five species in the holarctic, circumpolar fish family Esocidae. This species is generally distributed, in fresh water and rarely brackish water, along the Atlantic seaboard of North America from Nova Scotia (including parts of Quebec) to central Florida, along the Gulf coast westward to Texas, and north in the Mississippi valley to Missouri. It has been introduced outside this range.

Over most of this territory the chain pickerel is a sport fish of varying popularity and, at one time, formed a modest part of commercial landings. The angler record, as recorded by *Field and Stream*, is an individual 31 inches (787 mm) long, 14 inches (356 mm) in girth which weighed 9 pounds, 6 ounces, caught at Homerville, Georgia on February 17, 1961. There is, in the records of le Club de Pêche, Montréal, an unverified report of a chain pickerel of 19 pounds weight, taken in Quebec.

As one of the pikes, its potential as a sport fish and its role as a predator in the control of unwanted fishes have long been of interest. In the northern part of its range it is often regarded as a destructive predator of the young of Atlantic salmon and brook trout. In certain parts of its range eutrophication has changed environments to the point where this warm-water species constitutes an increasing proportion of the fauna. As a result of all the above factors, interest in the biology and exploitation of the chain pickerel is now increasing.

Overall the chain pickerel is an important but controversial part of the North American freshwater fish fauna. The literature is extensive, widespread and often not readily available. A large proportion of the available references are semi-popular and repetitive. The number of serious studies providing accurate data on the biology of the species which can be applied to its management is small.

The authors do not imply that the bibliography is in any way a complete one. It is our hope that readers aware of references not included will send them to the senior author so they can be added to the file. These will be available to interested workers and they will be on hand for a revision, should popularity of this list indicate that is warranted.

This bibliography is intended simply as a source book of available information and is aimed at a broad range of users seeking different types of information for a variety of purposes. It does not attempt to evaluate the information especially since many of the papers were never seen. The bibliography was not intended as an alternative to a meaningful analysis and interpretation of the information given in the original papers. Since interpretation and evaluation depend on purpose, we feel they are the responsibility

of the individual requiring the information. All the apparently important papers listed in our files or revealed by the search of bibliographic aids were obtained and annotated. The annotations will make obvious the relative contribution of the various works seen.

Some concept of the scope of available information can however be gained by a simple analysis of the relative number of references placed by us in the subject categories chosen. There are 630 references of which 175 or 27.8% are Dingell-Johnson Reports. For comments concerning categorization of these reports see item 6, p. 00. Of the remaining 455 references approximately 75% fall in the three headings Distribution and Range (39.4%), Taxonomy and Nomenclature (20.0%), and Management (15.2%). A further six categories at a much lower but rather uniform level of representation together constitute 51.1% of the literature. In descending order of importance these are: Life History and Habitat (9.9%), Popular Accounts (9.5%), Accounts by Political Areas (8.4%), Age and Growth (7.9%), Parasites, Pathology and Diseases (7.5%), and Food and Food Habits (7.0%). The remaining four subjects — Culture and Spawning, Predation, Anatomy, and Behaviour — range from 3.3% to 0.7%. The total of the percentages exceeds 100 as 36% of the references were cross-indexed in more than one category. It would appear from this that considerable is known of the general biology of the species, but in fact much of it is superficial. Very little is available on the physiology, biochemistry, anatomy, behaviour, ecology, and on the true role of the chain pickerel as a predator.

The authors felt this an appropriate time to make available the large file of references to this species which has accumulated as a result of our independent involvements with the chain pickerel. These personal files have been supplemented by 1) computer lists of references to Dingell-Johnson Reports, and other publications stored in the bibliographic file of the Library Reference Service, Federal Aid in Fish and Wildlife, Conservation Library Center in the Denver Public Library, Denver, Colorado; 2) references in a preliminary bibliography (unpublished) by Dr. J. M. Speirs, Dept. of Zoology, University of Toronto, and 3) those references listed in compendia of information on the biology of this species (e.g. McCabe, 1958; Wich and Mullan, 1958). The literature cited in all publications examined was, of course, checked for previously unrecorded references. The indices to standard zoological and fisheries journals were searched as were the *Dean Bibliography*, *Biological Abstracts*, *Sport Fishery Abstracts*, *Zoological Record*, *Dissertation Abstracts* and the two Sport Fishing Institute summaries of dissertations on fishery subjects by Jenkins (Bibliography of theses on fisheries biology. Washington, D.C. Sport Fish. Inst., 1959) and Martin (Bibliography of theses on fisheries biology. First Suppl., 1959-1971. Washington, D.C., Sport Fish. Inst., 1972). Those publications and the *Library of Congress Catalogue* were used to verify citations derived from other sources.

Wherever possible, all publications included in the bibliography were examined directly in order to assure the accuracy of the citation and to prepare an abstract. When a direct check was not possible, we resorted to standard bibliographic aids, or asked authors and agencies concerned to verify the citation. When none of these was possible, references were included in the

form available to us. Some of these are incomplete and all are marked (NV) for "not verified."

Many of the references not annotated were found in the literature cited sections of old publications and could not be obtained for annotation. The title of this bibliography would, however, have been far too ponderous if all the appropriate conditionals had been added. At times it was difficult to decide how a particular publication should be annotated. As a result the annotations are uneven and vary from a list of contents to a veritable abstract. Some annotations were taken from abstracting publications such as *Biological Abstracts* and *Sport Fishery Abstracts*, but most were written by referring directly to the publications.

In citations for each verified reference the total pages are given. Wherever possible, for larger works, the numbers of pages containing material on this species alone are also provided in brackets at the end of the annotation. For a limited number of the unverified references it has not been possible to determine whether the pagination given in our original records (and thus here) is the total number of pages in the original publication or only the pages for the chain pickerel.

For books which have appeared in several, unchanged editions we attempted to cite the most recent edition only. If there were changes in the title, the authors' names, or significant changes in that part of the text on the chain pickerel, more than one edition is cited.

The method of citing references was established on the basis of consistently using one which we felt would be familiar to fisheries workers. With so many references we aimed at the briefest one that would be as free as possible of confusing abbreviations. To accomplish this we followed the *Biological Abstracts 1968 List of Serials with Title Abbreviations* and *A Manual of Style, 12 ed. Univ. Chicago Press*. Where the style deviates elsewhere from lists of literature cited in other ROM publications these differences were required for greatest utility of the method used to prepare the bibliography.

The body of the bibliography is composed of a standard arrangement of publications in alphabetical order of authors' names and chronological order within authors. Therefore if the user is merely checking the details of a citation for which he knows the name of the author he can do so by referring directly to the body of the bibliography.

The subject index following the bibliography attempts to organize the subject matter dealt with by the individual publications. The index lists alphabetically, under each subject heading, the authors' names and the publication dates for all publications in the bibliography that apply; the complete reference can then be sought in the body of the bibliography. In order to provide increased utility to the reader, the subject index contains notations on the geographic area of the work cited. This refers to the area studied, not the place of publication. Where this is not given for a particular reference the area is either not known or the paper deals with the species in a general way, or over the whole of its distribution.

Subject categories were chosen on the basis of the subject matter represented by the accumulated references. The categories were given titles which we felt would best represent subject areas users would most naturally look

for. There is a moderate amount of cross indexing (36% of the titles appear in more than one category) in order to include in the index articles which treat several subjects or involve an area which encompasses more than one of the subject categories. The subject categories of the index are as follows:

1. **Accounts by Political Areas** — includes only publications usually entitled "The Fishes of" a particular political area. Such accounts generally involve at least brief comments for the species on almost all of the subject headings. Listing them otherwise would have required extensive multiple indexing. References in this category are not cross-indexed unless the account included a significant contribution to one of the other subjects. It is in papers or books indexed here that the reader will find at least basic information on the chain pickerel that is specific to his province or state.
2. **Age and Growth** — includes publications dealing with the determination and interpretation of these subjects.
3. **Anatomy** — includes both external and internal anatomy, especially osteology. It does not include references which list external anatomical features as part of a simple description of the animal; those appear under **Taxonomy, Nomenclature, and Systematics**.
4. **Behaviour** — includes only those dealing with ethology; concepts of behaviour which could be considered simply as habits are included under **Life History and Habitat**.
5. **Culture and Spawning** — includes references dealing with artificial aspects. Natural spawning was included here only if the study was carried out as an adjunct to fish culture. Otherwise references to natural spawning appear under **Life History and Habitat**.
6. **Dingell-Johnson Project Reports** — these reports of projects supported under U.S. federal aid to fisheries are not in general circulation and were largely derived from the Denver computer listings. Only some are annotated and for that reason they were difficult to categorize. We felt the readers might find it valuable to have all D-J reports indexed as such. Any that could readily be categorized will appear in the appropriate part of the index also. Almost all of them could be indexed under **Management**.

In these references the following abbreviations are part of the standard government designation of those reports: Proj. — project, PR — progress report, Job — job number assigned, wk.pl. — work plan, Fin. — final report, F-6-R-7 a coded number designation assigned to that report.

7. **Distribution and Range** — references included here vary from obvious ones dealing with the total range of this species to those which include the species in a checklist of a specific region, or list it as present at a single location.
8. **Food and Food Habits** — includes all discussions of food items or feeding activity.
9. **Hybrids** — includes references that deal with hybrids in nature or cultured in the hatchery or laboratory.
10. **Life History and Habitat** — includes the biology of the animal in nature, its ecology, habitat requirements, and response to environmental factors (e.g. oxygen requirements, lethal temperature).

11. **Management** — as well as the obvious, this category includes references to papers dealing with production, yield, and catch per unit effort. Most of the D-J reports indexed under that category probably could be equally well classified here.

12. **Parasites, Pathology, and Diseases** — pathology includes sublethal, adverse responses to chemicals and other foreign substances.

13. **Popular Accounts** — all accounts that deal with angling reminiscences or treat the biology of the animal in a popular, undocumented way or in popular or interpretative media such as the conservation periodicals of state and provincial agencies or outdoors magazines.

14. **Predation** — references were included here if the word “predation” is used in the title, or if it is readily interpreted from the text that the phenomenon of predation on, or predation by chain pickerel was studied. Otherwise, references on fishes eaten appear in **Food and Food Habits**. Although there are few references in this discrete category, they were separated since many people are interested in the potential of this species as a control of the numbers of other fishes.

15. **Taxonomy, Nomenclature, and Systematics** — as well as the obvious this category includes references to adequate taxonomic descriptions of the animal and various means of distinguishing it from other fishes. Many are cross-indexed here from **Accounts by Political Areas** and **Popular Accounts**.

For those unfamiliar with the rather confusing synonymy of the chain pickerel the name used in each reference, if not *Esox niger* or chain pickerel, is given in the annotation. As a further aid to the use of the literature on this species, included below under Nomenclature is a list of the various scientific names by which this species has been known, their authorities, and date and page number of first use. All the publications cited are included in the bibliography. Below that is a list of common names used over the years for this species.

NOMENCLATURE

Esox lucius, Mitchill (not Linnaeus 1758) 1814: 440. Mistaken for the northern pike but according to the description chain pickerel obviously intended.

Esox reticulatus LeSueur, 1818: 414. Original description, type locality Philadelphia. Name preoccupied in Europe.

Esox niger LeSueur, 1818: 415. Saratoga Lake, N.Y.

Esox tredecem-lineatus Mitchill, 1825, 361. Quoted from DeKay, 1842 as in the “Mirror,” no longer extant. At least by 1846 this name had been changed by authors to *E. tredecem-lineatus* and gradually the hyphen disappeared and the name became *E. tridecemlineatus*.

Esox tredecem-radiatus DeKay, 1842: 225.

Esox crassus Agassiz, 1854: 308.

Esox affinis Holbrook, 1860: 198.

Picorellus reticulatus (LeS.) Jordan, Jordan and Copeland, 1876: 143.

Picorellus affinis (Holb.) Jordan, Jordan and Copeland, 1876: 143.

Lucius reticulatus Les., Gill, 1898: 30.

COMMON NAMES

American pickerel, black chain pike, black pike, brochet maillé, brochet noir, brochet réticulé, chain pickerel, chain pike, common eastern pickerel, duck-billed pickerel, eastern pickerel, federation pike, grass pickerel, green pike, jack, jackfish, lake pickerel, lake pike, long-nosed pickerel, mud pickerel, pickerel, picquerelle, pike, pond pickerel, pond pike, red-finned pike, reticulated pickerel, shovel-nosed pickerel, snake, yellow pickerel.

Readers of this bibliography may be interested in a system utilizing moveable, typed strips which was used to prepare it. This system (Norfield Copy-strip) provides an opportunity to change, correct, or add individual references to an existing list without the necessity of retyping whole pages and proofreading again as a result of the retyping. A description of the system and its application to bibliographies is available in *Scholarly Publishing*, 1973, 4(3): 245-249.

Acknowledgments

The preparation of this bibliography involved the considerable task of completing and verifying the citations available at the outset and at the same time of searching for new ones. This time-consuming and frequently frustrating chore was most capably carried out by Cheryl Goodchild. Mrs. Goodchild also organized, manipulated, and photocopied the components of the unique system mentioned above which yielded the printer's copy of text and index.

We would like to extend our thanks to the staff of the Library of the Royal Ontario Museum, and in particular to Eve Dowie, for the generous help provided Mrs. Goodchild in our search for references.

The cover illustration was prepared by Mr. P. Buerschaper.

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Annotated Bibliography

Anon. (no date)

Les Poissons combattifs du Québec. Branche Touriste, Saint-Anne, Québec, 40 p.

Angling in Quebec waters.

Anon. (no date)

Pennsylvania fishes. Pennsylvania Fish Comm. :11.

Anon. 1870

Pickereel. Rep. Massachusetts Commr. Fish. for the year ending Jan. 1, 1870: 36-37.

Anon. 1871

Rapid growth of the pickerel (*Esox reticulatus*). Amer. Natur. 5:313-314.

Great quantities of small minnows about one inch (25 mm) long were consumed by two young pickerel about five inches (127 mm) long. The pickerel increased one inch (25 mm) in length in forty-eight hours.

Anon. (W.W.E.) 1874

Pickereel vs. trout. Forest Stream 3(10):155.

Decrease of trout in Adirondack waters was partially attributed to the increase in chain pickerel after they were put into Long Lake, Hamilton County. Report of a chain pickerel which had swallowed a large trout.

Anon. 1877

Pike, pickerel and maskalonge. Forest Stream 8(20):320.

Distinguishing features and description of *Esox reticulatus* and muskellunge, were given by a reader.

Anon. 1902 a

Pike, pickerel, mascalonge. Forest Stream 59(3):50-51.

Description, range and potential size of the chain pickerel given. For each of pike, chain pickerel and muskellunge, there is a drawing of the whole body and an enlarged one of the head. In reality some of the figure captions are in error (see Evermann, 1902) but that for *E. niger* is correct here.

Anon. 1902 b

Pike, pickerel, mascalonge. Forest Stream 59(4):71.

The captions for the illustrations which appeared in an earlier article (Anon. 1902 a) are revised. A short description of the chain pickerel appears in the text.

Anon. 1906

Pickereel fishing in the lakes — propagation of pickerel. Pennsylvania Dep. Fish., Rep. Dec. 1, 1904 to Nov. 30, 1905:23-24, 57-59, 143-146.

Anon. 1907 a

Pickereel fishing in the lakes — muscallonge — field work — pickerel work. Pennsylvania Dep. Fish., Rep. Dec. 1, 1905 to Nov. 30, 1906:21-22, 23-28, 51-55, 140-141.

Anon. 1907 b

Do hornpout "hook" pickerel? Maine Woods 24(51):1.

Anon. 1950

Lakes and ponds. New Jersey Dep. Conserv., Fish. Surv. Rep. no. 1, 189p. (N.V.)

Anon. 1955 a

South Carolina wildlife. Summer, 1955. South Carolina Wildlife Resour. Dep., Inform. Educ. Div., Educ. Rel. 104 (N.V.)

Anon. 1955 b

Quabbin Reservoir investigations. Computation of data. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-1, Job 2, 4 p.

Anon. 1957

Fisheries management investigations of impoundments. Brush shelter evaluation. Virginia Comm. Game Inland Fish., D-J Proj. F-5-R-3, Job 5, Sum, 7 p.

Anon. 1958

Reclamation of the Deerfield River for trout and evaluation of this technique as applied. Reclaim and conserve Deerfield fishing. Massachusetts Div. Fish. Game, D-J Proj. F-14-R-1, PR, 14 p.

Anon. 1959

A fishery survey of the lakes and ponds of Connecticut. Connecticut State Board Fish. Game, D-J Proj. F-4-R, Rep. no. 1, 395 p.

General habitat requirements are given as well as a growth curve for Connecticut pickerel. Various associations of species known to produce reasonable fishing in some small Connecticut ponds are listed and include the largemouth bass, chain pickerel, yellow perch and golden shiner combination.

Anon. 1960

New standard encyclopedia. Chicago, Illinois, Standard Education Society Inc. (N.V.)

Esox niger mentioned on p. 243.

Anon. 1962 a

Fishes of Delaware. Delaware Board Game Fish Commrs., Dover, 4 p.

Two members of the pike family are found in freshwater ponds, the chain pickerel and the redbfin pickerel. The chain pickerel is by far the more popular, however some anglers consider it a trash fish.

Anon. 1962 b

Some North Carolina freshwater fishes. North Carolina Wildlife Resour. Comm., 46 p.

The chain pickerel has the typical long and thin body conformation of all pikes. This pickerel is a common inhabitant of the Atlantic Coastal drainage from Maine to Texas. In North Carolina, it is found in the bays of the Coastal Plain, blackwater lakes and streams of the Piedmont, into the Yadkin River drainage. It is one of the most popular game fishes of North Carolina.

Anon. 1968 a

Louisiana sport fish investigations. Annual progress report. (Fish population studies). Louisiana Wildlife Fish. Comm., D-J Proj. F-14-1, Job 5, p. 128-142.

Fish population data is presented on D'Arbonne Lake. The pounds per acre of chain pickerel sampled by rotenone varied from 1.30 to 16.07 (1.46 to 17.99 kg/hect). Pounds per Trammel net day of harvestable pickerel

varied from 0.31 to 5.52 (0.14 to 2.50 kg/trammel net day). Pounds per trap net day of harvestable pickerel ranged from 0.19 to 1.05.

Anon. 1968 b

Spawning statistics, chain pickerel. Pennsylvania Fish Comm., Pleasant Mount Hatchery, 3 p. (mimeo)

Temperature during spawning was 44°F to 50°F (6.7°C to 10°C) (surface). Females could not be completely spawned out at one time. Pickerel fry feed more vigorously than muskellunge and are easier to get started. Cannibalism noted after fingerlings were two inches.

Abbott, C. C. 1876

A voracious fish. Forest Stream 5(26):404.

A record of a predator-prey size chain involving two chain pickerel and two central mudminnows. A chain pickerel had eaten a mudminnow which contained a small chain pickerel which in turn had eaten a small mudminnow.

Adams, A. L. 1873

Field and forest rambles with notes and observations on the natural history of eastern Canada. London, King and Co. 333 p.

Implied that about 1863, the chain pickerel was introduced into Maine, in the Grand Lake portion of the St. Croix River system.

Adams, C. C. and T. L. Hankinson 1928

The ecology and economies of Oneida Lake fishes. Roosevelt Wild Life Ann. 1(3,4):235-548.

Other common names, distinguishing features, breeding habits, life history, habitat, distribution records, food of adults and of young as revealed by stomach examination, enemies and disease, and economic relations. (p. 388-396)

Agassiz, L. 1854

Notice of a collection of fishes from the southern bend of the Tennessee River, in the State of Alabama. Amer. J. Sci. Arts, Second Series 17(50):297-308 Appendix and 17(51):353-365.

A taxonomic comparison of *E. crassus* and *E. reticulatus*.

Anderson, W. D., Jr. 1964

Fishes of some South Carolina coastal plain streams. Florida Quart. J. Acad. Sci. 27(4):31-54.

Lists the freshwater fishes collected in the Ashpoo, Combahee, Broad and New River drainages of South Carolina from 1956-1960. Of 120 stations sampled, a total of 142 chain pickerel were collected at 36 stations.

Andrews, T. J. and G. E. Hanson 1957

Comparison of age of chain pickerel by scales, opercles, and otoliths (sacculus). Raw unpublished data, Univ. Massachusetts. 3 p.

Contains data on interpreted annuli from otoliths (sacculus), scales and opercles of 33 pickerel as well as the magnified diameters of the right and left sacculus from 30 of the 33 *E. niger*.

Armbruster, D. C. 1959

Observations on the natural history of the chain pickerel (*Esox niger*). Ohio J. Sci. 59(1):55-58.

Chain pickerel were first introduced into Ohio in 1935. Pickerel were

collected by fyke nets for study in 1951. They occur in shallow areas in spring and fall, but inhabit deeper water during summer. Data is presented on spawning and age and growth.

Armbruster, D. C. 1960

The hybridization of the eastern chain pickerel (*Esox niger*), northern pike (*Esox lucius*). M.S. Rep. Ohio Div. Wildlife, 5 p.

Armbruster, D. 1966

Hybridization of the chain pickerel and northern pike. Progr. Fish-Cult. 28(2):76-78.

A 14 inch (356mm) female chain pickerel was crossed with two 18 inch (457 mm) northern pike males. Hatching success of eggs was 65.5%. Hybrid fingerlings seemed to suffer less mortality than muskellunge or chain pickerel fingerlings. Growth of hybrids was intermediate to the parent species.

Armstrong, J. G. and J. D. Williams 1971

Cave and spring fishes of the southern bend of the Tennessee River. J. Tenn. Acad. Sci. 46(3):107-115.

One of the 47 species collected from 68 springs. Fig. 1 indicates the location of the collection stations in the southern bend of the Tennessee River.

Arve, J. E. 1961

Maryland statewide inland fisheries investigation. Fish population studies to establish indices of population structure and trends in the fishery. Maryland Dep. Game Inland Fish, D-J Proj. F-10-R-4, Job 3, 60 p.

Atkins, C. G. 1884

Notes on landlocked salmon. Trans. Amer. Fish-Cult. Ass. 13th Annu. Meeting:40-59.

Noted introduction into Schoodic lakes of Maine from the Penobscot River. Attributed disappearance of landlocked salmon to the attacks of pickerel.

Ayres, W. O. 1843

Enumeration of the fishes of Brookhaven, Long Island, with remarks upon the species observed. Boston J. Natur. Hist. 4(3):252-282.

Ayres examined pickerel, which he says were incorrectly called *Esox lucius* by Dr. Mitchell, and could not find any differences to warrant considering them distinct from LeSueur's *reticulatus*. Also considers DeKay's description and figure of *fasciatus* to be no different from *reticulatus*, as characters attributed to the smaller fish he says are not permanent. Says that small size of *reticulatus* distinguishes it as a separate species from any of the larger fish of our ponds and streams. Ayres called a specimen of 38 inches (968 mm), 14 pounds (6.36 kg) *E. reticulatus* but it was probably *E. lucius*.

Bailey, J. R. and J. A. Oliver 1939

The fishes of the Connecticut watershed. P. 150-189. In A biological survey of the Connecticut watershed. New Hampshire Fish Game Dep., Rep. no. 4, 256 p.

Gives general distribution in New Hampshire and a short descriptive note on feeding habits and management. Tables of fishes of each of the lakes and ponds of the Connecticut Watershed.

Bailey, R. M. 1938

The fishes of the Merrimaek watershed. P.149-185. In Biological survey of

the Merrimack watershed. New Hampshire Fish Game Comm., Surv. Rep. no. 3, 238 p.

Gives range, distribution, and fish collection localities in New Hampshire. *E. americanus* x *E. niger* hybrids were taken. Short note mentions abundance, habitat and feeding habits. Key.

Bailey, R. M., J. E. Fitch, E. S. Herald, E. A. Lachner, C. C. Lindsey, C. R. Robins and W. B. Scott 1970

A list of common and scientific names of fishes from the United States and Canada. 3rd ed. Amer. Fish. Soc. Spec. Publ. no. 6, Washington, D.C. 150 p.

Standard for accepted common and scientific name, p. 18.

Bailey, R. M., H. E. Winn and C. L. Smith 1954

Fishes from the Escambia River, Alabama and Florida with ecological and taxonomic notes. Proc. Acad. Natur. Sci. Philadelphia 106:109-164.

Collections were taken chiefly from the Lower Escambia River, including tidewater. Collection stations are described and species taken listed. Gives *E. niger* synonymy.

Baker, F. C. 1916

The relation of mollusks to fish in Oneida Lake. New York Coll. Forest., Tech. Publ. no. 4, 366 p.

Lists Class Nematoda as occurring in the intestine of a pickerel (117 mm long).

Baker, F. C. 1918

The productivity of invertebrate fish food on the bottom of Oneida Lake, with special reference to mollusks. New York Coll. Forest., Tech. Publ. no. 9, 284 p. (N.V.)

Bamberg, R. M. 1967

Fish population control recommendations. Texas Parks Wildlife Dep., D-J Proj. F-3-R-14, wk. pl. B, Job 24, 12 p.

Bangham, R. V. 1941

Parasites of fresh-water fish of southern Florida. Proc. Florida Acad. Sci. 5:289-307.

Barker, J. L. 1963

Creation and evaluation of artificial oxbows and lagoons. New Jersey Div. Fish. Game, D-J Rep. F-9-R-6, Job 11, 6 p.

Barr, L. M. 1962

A life history study of the chain pickerel, *Esox niger* Lesueur, in Beddington Lake, Maine. Univ. Maine, M.Sc. diss., 35 p.

Bayless, J. D. 1967

Fisheries investigations in lakes and streams — district five. Reservoir investigations. South Carolina Div. Game Boating, D-J Proj. F-1-R-15, Job 3, p. 2-20, 23-36.

Beamish, R. J., M. J. Merrilees and E. J. Crossman 1971

Karyotypes and DNA values for members of the suborder Esoeoidei (Osteichthyes: Salmoniformes). Chromosoma 34:436-447.

Summary of chromosome counts; relative and absolute amounts of DNA/mg cell; for the Esoeoidei including *E. niger*. Figure of karyotype prepared from gill tissue.

Bean, T. H. 1891

The pike family — II. Forest Stream 36(12):233.

Quotes Dr. Mitchell's account of federation pike from Oneida Lake. The peculiar colouration described in that account is said to be due to the spawning condition of the fish. Also describes age variation in colour and markings, distribution, and mode of capture.

Bean, T. H. 1897 a

Notes upon New York fishes received at the New York Aquarium, 1895 to 1897. Ann. Rep. Commr. Fish., Game Forests New York (1896): 207-251.

Presents taxonomic characters and general information as well as range and distribution of *Esox niger*.

Bean, T. H. 1897 b

Notes upon New York fishes received at the New York Aquarium, 1895 to 1897. Bull. Amer. Mus. Natur. Hist. 9:327-375.

Identical to Bean, T. H. 1897 a.

Bean, T. H. 1902

The food and game fishes of New York. Includes notes on their common names, distribution, habits and mode of capture of New York fishes. New York Forest, Fish Game Comm., 7th rep.:251-560.

For *E. reticulatus* LeSueur, gives synonymy, common names, distribution, habitat, feeding, spawning, angling and fungus in captivity. Appears in chart of recorded distribution of the food and game fishes of New York.

Bean, T. H. 1903

Catalogue of the fishes of New York. Albany, New York State Univ., New York State Mus., Bull. no. 60, Zoology 9, 794 p.

For *Lucius reticulatus* (LeSueur), gives synonymy, taxonomic description, other common names, possible account of hybridization, occurrence, habitat, size, short note on angling, spawning, food and fungus infections.

Bean, T. H. 1911

Report of the State Fish Culturist. New York Conserv. Comm., Div. Fish Game:135-142.

Black and white drawing of *Esox reticulatus* LeSueur.

Behnke, R. J. and R. M. Wetzel 1960

A preliminary list of the fishes found in the fresh waters of Connecticut. Copeia 1960(2):141-143.

Annotated list of fishes includes *E. niger*.

Black, J. D. and L. O. Williamson 1947

Artificial hybrids between muskellunge and northern pike. Trans. Wisconsin Acad. Sci. Arts, Lett. 38:299-314.

Boccardy, J. A. 1955 a

Collection of field data. Seasons creel census on Quabbin Reservoir, Massachusetts. Massachusetts Div. Fish. Game, D-J, Proj. F-6-R-1, Job 1, 11 p.

Boccardy, J. A. 1955 b

Quabbin Reservoir investigations. Computation of data. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-2, Job 3, 6 p.

Boccardy, J. A. 1956 a

Quabbin Reservoir studies. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-2-, Job 1, 14 p.

Boccardy, J. A. 1956 b

Quabbin Reservoir investigations. Population studies. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-2, Job 2, 8 p.

Boldyreff, E. B. 1935

A microscopic study of the panereas in fishes; especially those of the Orders Hamplomi and Cyprinodontes. *Copeia* 1935(1):23-33.

Type and structure of panereas resembles *E. vermiculatus*. (p. 25,27)

Bond, L. H. 1956

Investigation of eastern brook trout, landlocked salmon and lake trout in Cold Stream Watershed. Landlocked salmon and brook trout of Cold Stream Drainage, Penobscot County, Maine. Maine Dep. Inland Fish. Game, D-J Proj. F-5-R-4, 23 p.

Bond, L. H. 1961

Statewide lake and stream investigations. Age and growth studies. Maine Dep. Inland Fish. Game, D-J Proj. F-8-R-9, Job 3, 37 p.

Bond, L. H. 1962

Statewide lake and stream investigations. Age and growth studies. Maine Dep. Inland Fish. Game, D-J Proj. F-8-R-10, Job 3, 38 p.

Bond, L. H. 1963

Statewide lake and stream investigations. Age and growth studies. Maine Dep. Inland Fish. Game, D-J Proj. F-8-R-11, Job 3, 23 p.

Bond, L. H. 1964

Statewide lake and stream investigations. Age and growth studies. Maine Dep. Inland Fish. Game, D-J Proj. F-8-R-12, Job 3, 19 p.

Bonn, E. W. 1954

Inventory of species present and their distribution in that portion of the upper Sabine drainage which lies within Region 2B. Texas Parks Wildlife Dep., D-J Proj. F-8-R-1, wk. pl. B, Job 3, 6 p.

Bonn, E. W. 1958

Basic survey and inventory of species present in the Red River drainage, other than Lake Texoma, in Region 2B. Texas Parks Wildlife Dep. D-J Proj. F-8-R-4, wk. pl. 8, Job 15, 16 p.

Bonn, E. W. 1965

Fisheries reconnaissance. Texas Parks Wildlife Dep., D-J Proj. F-8-R-11, wk. pl. B, Job 21, 21 p.

Bonn, E. W. and C. R. Inman 1956

Basic survey and inventory of species present and their distribution in the Cypress Creek Drainage in Region 2B. Texas Parks Wildlife Dep., D.J Proj. F-8-R-3-, wk. pl. B, Job 11, 21 p.

Boschung, H. T., Jr. 1961

An annotated list of fishes from the Coosa River system of Alabama. *Amer. Midland Natur.* 66(2);257-285.

Gives location, map index, water condition, water chemistry, number of fish caught with average total length, for fish collection stations. Includes short synonymy for *E. niger*.

Breder, C. M., Jr. and D. E. Rosen 1966

Modes of reproduction in fishes. Published for the Amer. Mus. Natur. Hist., Natur. Hist. Press, Garden City, New York. 941 p.

Notes on spawning habits, emission of eggs, sex ratio. Mentions hybrids between *E. niger* and *E. americanus*.

Bridges, W. L. 1963

Evaluation of the effects of partial reclamation on warm water lakes. Rhode Island Div. Fish. Game, D-J Proj. F-20-R-4, Job 1, 4 p.

Bridges, W. L. and R. Guthrie 1962

Fishery investigations. Pond surveys. Rhode Island Div. Fish. Game, D-J Proj. F-20-R-3, Job 11, 9 p.

Bridges, W. L. and R. C. Guthrie 1965

Fishery investigations. Pond surveys. Rhode Island Div. Fish. Game, D-J Proj. F-20-R-7, Job 11, 20 p.

Bridges, C. H. and R. S. McCaig 1958

Harvest studies on managed ponds. Massachusetts Div. Fish. Game, D-J Proj. F-10-R-1, Jobs 1 and 2, 23 p.

Briggs, J. C. 1958

A list of Florida fishes and their distribution. Bull. Florida Mus. Biol. Sci. 2(8):223-318.

Brief note on United States distribution. (p. 257)

Buck, D. H. 1964

Life history and growth of the chain pickerel in Illinois. Illinois Dep. Conserv., D-J Proj. F-16-R-2, wk. pl. 3, 1 p.

Salvaged yearling fish stocked in a new 160 acre (64.8 hec) lake spawned the next year (1963). Limited creel census has shown that anglers are catching and releasing pickerel, indicating they have become established.

Buck, D. H. 1965

Life history and growth of the chain pickerel in Illinois. Illinois Dep. Conserv., D-J Proj. F-16-R-3, wk. pl. 3, 1 p.

Pickerel spawned in 1963 entered the creel as 12-14 inch (305-356 mm) fish in 1964. The 1964 year-class is believed to be small in number. Sampling in 1964 revealed extremely large numbers of largemouth bass 4 to 8 inches (102-203 mm).

Buck, D. H. 1969

Research on ecology of sport fish and sport fishery management in Illinois. Life history and growth of the chain pickerel in Illinois. Illinois Dep. Conserv., D-J Proj. F-16-R-7, wk. pl. 3, Job B, Fin., 9 p.

Buck, D. H. and C. F. Thoits III 1966

Life history and growth of the chain pickerel in Illinois. Illinois Dep. Conserv., D-J Proj. F-16-R-4, wk. pl. 3, 3 p.

Approximately 20,000 advanced sac fry were distributed in four farm ponds with combinations of bluegill, bluegill-largemouth bass, and lake chubsuckers-smallmouth bass. Although spring growth of pickerel was good, summer growth was poor.

Buck, D. H. and C. F. Thoits III 1967

Life history and growth of the chain pickerel in Illinois. Illinois Dep. Conserv., D-J Proj. F-16-R-5, wk. pl. 3, Job B, 2 p.

Experimental stockings indicated that (1) pickerel fry and fingerlings are highly vulnerable to predation by largemouth bass; (2) age 0 and age 1 pickerel compete poorly with largemouth of the same age and may be more

compatible with smallmouth; (3) pickerel do better in clear than in muddy waters; (4) the pickerel is an inefficient predator of bluegill.

Buck, D. H. and C. F. Thoits III 1970

Dynamics of one-species populations of fishes in ponds subjected to cropping and additional stocking. Illinois Natur. Hist. Surv. Div. Bull. 30(2):69-165.

High pH credited with the deaths of an experimental population of *E. niger*. Foraging by a large population of crayfish in a 4 acre (1.6 hec) pond destroyed eggs and larvae. (p. 13.82)

Buntz, J. 1967

Stomach analysis of chain pickerel (*Esox niger*) of south central Florida. Proc. 20th Annu. Conf. Southeast Ass. Game Fish Commrs. 20:315-318.

Trammel nets most effective method of collecting pickerel. From 115 adult pickerel collected from 6 lakes, 38.3% (44) contained food. Although soft-rayed fish were abundant in these lakes, 49.9% of all recognizable fish consumed were spiny-rayed fish. Relatively large pickerel (15-23 inches) (381-584 mm) consumed prey ranging from 2-5 inches (51-127 mm) in length. Data indicated pickerel has potential as a desirable predator in south central Florida.

Burkholder, P. R. and R. Bere 1933

Plankton studies in some lakes of the Upper Hudson watershed. Sect. 8, p. 239-260. In A biological survey of the Upper Hudson watershed. Suppl. 22nd Annu. Rep., New York Conserv. Dep., Biol. Surv. (1932) no. 7, 341 p.

Note on collection of 16 young chain pickerel. (p. 257)

Burton, G. W. and E. P. Odum 1945

The distribution of stream fish in the vicinity of Mountain Lake, Virginia. Ecology 26(2): 182-194.

E. niger is listed as being found in Johns and Craig Creek (James River drainage) and may be the reason for the decrease in population numbers and species of other fishes. Lowland streams, below 1400 feet (426.4 m) with low gradient (10-30 ft./mile) (1.9-5.7 m/km), were characterized by *Esox* and centrarchids.

Buss, K. and J. Miller (no date) a

The age and growth of fishes in Pennsylvania. Harrisburg, Pennsylvania, Fish Comm., Pub. Relations Div., part 13. (N.V.)

Buss, K. and J. Miller (no date) b

Identifying the common fishes of Pennsylvania. Pennsylvania Fish Comm., Benner Spring Fish Res. Sta., 16 p. (N.V.)

Buss, K. and J. Miller 1962

The age and growth of the chain pickerel in Pennsylvania. Pennsylvania Fish Comm., Benner Spring Fish Res. Sta., Pennsylvania Angler:10-11.

General notes on distribution, common names, habitat and spawning. Data on length-weight relationship of 632 chain pickerel; average calculated total lengths of chain pickerel at each annulae from various locations. Angling tips for all seasons.

Buss, K. and J. Miller 1967

Interspecific hybridization of Esocids: hatching success, pattern development and fertility of some F₁ hybrids. U.S. Dep. Interior, Fish Wildlife Serv.,

Bur. Sport Fish. Wildlife, Tech. pap. 14, 30 p.

The chain pickerel was crossed with the following esocids: northern pike (no evidence of F_1 hybrids being fertile); muskellunge (no signs of maturity at two years of age — egg viability fair); redbfin pickerel (hybrids were fertile — this cross shows most potential for practical application); grass pickerel (F_1 hybrids were viable).

Caine, L. S., ed. 1949

Chain pickerel, *Esox niger*. Michigan, James Heddon's Sons, Heddon Fish Flashes, Release no. 139, 4 p.

Primarily of interest to the sport fisherman. Short notes on characteristics, range, size, flavour, food, lures, methods, tackle.

Caine, L. S. 1949

North American freshwater sport fish. N.Y., A. S. Barnes and Co. 212 p.

General notes on angling, colloquial names, colouration, characteristics, range, habitat, size, flavour, natural foods, artificial lures, methods of angling. Black and white drawing.

Carlander, K. D. 1969

Handbook of freshwater fishery biology. Life History data on freshwater fishes of the United States and Canada, exclusive of the Perciformes. Iowa State Univ. Press, vol. 1. 752 p.

Tabular data and explanatory notes on: range, habitat, length-weight, length and weight at various ages and annuli, growth, reproduction, food habits, sizes taken in gill nets. (p. 329-336)

Carnes, W. C. 1968

Fish management research. Small lakes investigations. Fish escapement from small lakes. North Carolina Wildlife Resour. Comm., D-J Proj. F-16-R-4, wk. pl. 2, Job G, Fin., 11 p.

Carpenter, C. 1965

Chains for a change. Texas Game Fish, Feb.:6,7,30. (N.V.)

Chain pickerel are present in the Caddo Lake area but are not well known by most Texans. Most chain pickerel from Caddo Lake were just over a foot long (305 mm). Largest pickerel reported taken from Caddo Lake was just over four pounds (1.8 kg).

Carpenter, R. G. and H. R. Siegler 1947

A sportsman's guide to the freshwater fishes of New Hampshire. New Hampshire Game Fish Comm. 87 p.

Detailed characters for identification.

Carr, A. F., Jr. 1936

A key to the fresh-water fishes of Florida. Proc. Florida Acad. Sci. 1:72-86.

Esox niger appears in the key.

Carr, A. and C. J. Goin 1955

Guide to the reptiles, amphibians and fresh-water fishes of Florida. Gainesville, Univ. Florida Press. 341 p.

Key. Brief notes on appearance, characteristics, description, distribution, range and habitat.

Carter, E. R. 1952 a

Kentucky lake investigations. Netting operations. Kentucky Dep. Fish Wildlife Resour., D-J Proj. F-2-R-1, wk. pl. 1, Job B, QU2, 4 p.

Carter, E. R. 1952 b

Kentucky lake investigations. Netting operations. Kentucky Dep. Fish Wildlife Resour., D-J Proj. F-2-R-1, wk. pl. 1, Job B, QU3, 3 p.

Carter, E. R. 1952 c

Kentucky lake investigations. Rotenone samplings. Kentucky Dep. Fish Wildlife Resour., D-J Proj. F-2-R-1, wk. pl. 1, Job D, QU3, 2 p.

Catt, J. 1949

Small-mouthed black bass in the waters of New Brunswick and Nova Scotia. Canadian Fish Cult. 4(5): 15-18.

Noted that chain pickerel were abundant in Darling's Lake and the delta of the Hammond River.

Cavender, T. M., J. G. Lundberg and R. L. Wilson 1970

Two new fossil records of the Genus *Esox* (Teleostei, Salmoniformes) in North America. Northwest Sci. 44(3): 176-183.

Although *E. niger*, *E. masquinongy* and *E. americanus* are endemic to North America, the fossil record has provided little evidence on their evolutionary history. Includes a distribution map showing both today's boundaries and fossil locations. Fossil material examined included 2 dry *E. niger* skeletons. Fossil palatines from Itchtuckee River were tentatively identified as *E. niger* based on the bone size. Discusses depressible type of palatine tooth (common to esocids) and differences between species. Figure 2 shows palatine bones.

Chadwick, J. W. 1969

Pond surveys. Rhode Island Div. Fish. Game, D-J Proj. F-20-R-10, wk. pl. 1, Job 1, 15 p.

Chalmers, T. 1879

Pickerel fishing through the ice. Chicago Field 11:52.

Cheney, A. N. 1896

Mascalonge, pike, pickerel and pike-perch. First Annu. Rep. Comm. Fish. Game Forest New York (1895): 121-124.

Chew, R. L. 1967

Largemouth bass study. Early life-history investigation. Florida Game Fresh Water Fish Comm., D-J Proj. F-24-R-1, Job 2, p. 42-71.

Circle, H. (no date)

Chain pickerel, *Esox niger*. Michigan, James Heddon's Sons, Heddon Fish Flashes, Release no. 55K, 3 p.

General information on biology, identification, range, world record, natural foods, suitable tackle, angling tips for the sport fisherman.

Clay, W. M. 1962

A field manual of Kentucky fishes. Kentucky Dep. Fish Wildlife Res., 147 p.

Lists features by which the chain pickerel can be separated from the *E. a. vermiculatus*. Range in Kentucky is restricted to extreme western part of this state. (p. 43)

Cobb, K. 1934

The pond fish restoration program. P.25-40. In Connecticut Board Fish. Game, 20th Bien. Rep. (1932-34), Pub. Doc. no. 19, 146 p.

Discusses conflict or competition between bass and pickerel, angling and management (hatcheries).

Compton, K. R. 1963 a

Angler harvest comparisons of the fly-fishing only and open fishing stretches of the Big Flatbrook. New Jersey Div. Fish Game, D-J Proj. F-20-R-1, wk. pl. 1, Job 2, 26 p.

Compton, K. R. 1963 b

Evaluation of fingerling trout stockings in small streams and ponds. New Jersey Div. Fish Game, D-J Proj. F-20-R-1, wk. pl. 2, Job 3, 14 p.

Compton, K. R. 1964 a

Acid water trout studies. New Jersey Div. Fish Game, D-J Proj. F-20-R-2, wk. pl. 2, Job 2, 12 p.

Compton, K. R. 1964 b

Angler harvest comparisons on the fly-fishing of the Big Flatbrook. New Jersey Div. Fish Game, D-J Proj. F-20-R-2, wk. pl. 1, Job 2, 37 p.

Compton, K. R. 1964 c

Evaluation of trout stocking in the South Branch of the Raritan River. New Jersey Div. Fish Game, D-J Proj. F-20-R-2, wk. pl. 1, Job 4, 26 p.

Cook, F. A. 1959

Freshwater fishes in Mississippi. Mississippi Game Fish Comm. 239 p.

General description of the chain pickerel, with a list of collections taken from Mississippi waters. Key. (p. 71-73)

Cooper, A. 1971

Fishes of the world. A Grosset all-colour guide. New York, Grosset and Dunlap. 159 p.

Discusses general habits of pike and chain pickerel.

Cooper, G. P. 1939 a

A biological survey of the waters of York County and the southern part of Cumberland County, Maine. Maine Dep. Inland Fish. Game, Fish Surv. Rep. no. 1, 58 p.

Abundant in streams, otherwise good trout waters. Found in ponds of the 11 drainage areas.

Cooper, G. P. 1939 b

A biological survey of thirty-one lakes and ponds of the upper Saco River and Sebago Lake drainage systems in Maine. Maine Dep. Inland Fish. Game, Fish Surv. Rep. no. 2, 147 p.

Habitat, food, spawning. Game and food fish collected in ponds surveyed. Estimated abundance, management recommendations. See notes on each of the lakes and ponds.

Cooper, G. P. 1941

A biological survey of lakes and ponds of the Androscoggin and Kennebec River drainage systems in Maine. Maine Dep. Inland Fish. Game, Fish Surv. Rep. no. 4, 238 p.

Habitat, food, spawning. Stomach contents of fish collected from 32 lakes. Distribution and abundance. Stomach analysis. Recommendations.

Cooper, G. P. 1942

A biological survey of the lakes and ponds of the central coastal area of Maine. Maine Dep. Inland Fish. Game, Fish Surv. Rep. no. 5, 184 p.

Notes on distribution, abundance and frequency. Taken from 36 lakes. Stomach contents, feeding and conclusions. Management recommendations.

Cope, E. D. 1869

Supplementary synopsis of the Esoces of middle North America. Trans. Amer. Phil. Soc. 13(2):407-410.

Key and note on *E. reticulatus*.

Cope, E. D. 1870

Partial synopsis of the fresh-water fishes of North Carolina. Proc. Amer. Phil. Soc. 11:448-495. (N.V.)

Corning, R. V. 1967 a

Warmwater fisheries management investigations. (General Survey) Virginia Comm. Game Inland Fish., D-J Proj. F-5-R-12, Job 9, p. 15, 16.

In the freshwater portion of the Mattoponi River and its drainage, chain pickerel are one of the major sport fishes.

Corning, R. V. 1967 b

Warmwater fisheries management investigations. Virginia Comm. Game Inland Fish., D-J Proj. F-5-R-11, Job 9, 25 p.

E. niger is listed as inhabiting the Blackwater River and being well distributed throughout the sampling sites.

Corning, R. V. 1967 c

Warm water fisheries management investigations. Copper sulfate toxicity study. Virginia Comm. Game Inland Fish., D-J Proj. F-5-R-13, Job 7, 38 p.

Couture, L. H. 1957

Seventy-four million dollars a year just for fun. Massachusetts Div. Fish. Game Bull. no. 14, 11 p.

Cox, P. 1896 a

History and present state of the Ichthyology of New Brunswick. New Brunswick Natur. Hist. Soc. Bull. no. 13:27-61.

Erroneously attributed the first record of this species in New Brunswick to Adams, 1873.

Cox, P. 1896 b

Catalogue of the marine and freshwater fishes of New Brunswick. New Brunswick Natur. Hist. Soc. Bull. no. 13:62-75.

Reported chain pickerel as quite common on lower St. John and its affluents.

Cox, P. 1899

Fresh water fishes and Batrachia of the Peninsula of Gaspé, P.Q., and their distribution in the maritime provinces of Canada. Trans. R. Soc. Canada 2nd Ser. 5(4):141-154.

Reported that 20 years previous (to 1899) the eastern pickerel *Esox reticulatus*, LeSueur, a common fish in Maine rivers, made its appearance in the St. John, but inquiry revealed the fact that a few years before it had been artificially introduced into the Maduxnakik, a branch of the St. John.

Cox, P. 1901

Cyprinidae of Eastern Canada. Proc. Natur. Hist. Ass. Miramichi, no. 2:36-45.

Chain pickerel said to have 'recently' appeared in the St. John but found that it had been artificially introduced into the Maduxnakik, a branch of that River.

Crittenden, E. (no date)

A pre-impoundment fishery study of North Bay and associated waters, Bay County, Florida. Proc. 11th Annu. Conf., Southeastern Ass. Game Fish Commr.:211-219.

Crossman, E. J. 1960

Variation in number and asymmetry in branchiostegal rays in the family Esocidae. Can. J. Zool. 38:363-375.

Great variability exists in teleost fishes which have high numbers of meristic parts. In the family Esocidae this variability is apparent in the branchiostegal rays. In a sample of 32 chain pickerel, 15(47%) were asymmetrical, 17(53%) were symmetrical and an additional 3(9%) were symmetrical in number of rays only.

Crossman, E. J. 1962 a

The grass pickerel *Esox americanus vermiculatus* LeSueur in Canada. R. Ont. Mus., Life Sci. Contr. no. 55, Univ. Toronto Press, 29 p.

Characters to separate Esocids. Black and white drawing.

Crossman, E. J. 1962 b

The redbfin pickerel, *Esox a. americanus* in North Carolina. Copeia 1962(1): 114-123.

Characters useful to distinguish *E. americanus* from *E. niger*. Comparison of body shape, colour pattern, brachistegal ray counts, supraorbital bar shape, fin shape, habitat. Drawing.

Crossman, E. J. 1962 c

Predator-prey relationships in pikes (Esocidae). J. Fish. Res. Board Canada 19(5):979-980.

Predator-prey relationships are common among freshwater fishes but are generally non-specific and choice of prey depends on relative abundance only. However, in one study of *E. niger*, young bullheads were the most frequent prey of pickerel, although other species were more abundant than the bullheads.

Crossman, E. J. 1966

A taxonomic study of *Esox americanus* and its subspecies in eastern North America. Copeia 1966(1):1-20.

Synonymy includes *Esox niger* and *Esox reticulatus*. Replaces *E. americanus* in larger bodies of water east and south.

Crossman, E. J. 1971

Pike. Related forms and history. Appendix 2, p. 292-307. In F. Buller. Pike. London, Macdonald and Co. Ltd. 320 p.

Notes and distribution, angling records, growth, age-length-weight, food habits, hybrids, habitat, spawning, angling.

Crossman, E. J. and K. Buss 1965

Hybridization in the Family Esocidae. J. Fish. Res. Board Canada 22(5): 1261-1292.

Information is given on description, growth, fertility and vitality of the following chain pickerel hybrids: muskellunge x chain pickerel; northern pike x chain pickerel; chain pickerel x redbfin pickerel; and chain pickerel x grass pickerel.

Crowell, T. E. 1968

Fish management research. Currituck Sound investigations. Distribution of fish populations, Currituck Sound. North Carolina Wildlife Resour. Comm., D-J Proj. F-16-R-4, wk. pl. 1, Job C, Fin, p. 10-12, 28-31.

Cuerrier, J.-P., F. E. J. Fry et G. Préfontaine 1946

Liste préliminaire des poissons de la région de Montréal et du lac Saint-Pierre. Natur. Canadien 73:17-32.

Distribution in Quebec. Specimen from Sturgeon River.

Cuvier, G. and M. A. Valenciennes 1846

Histoire naturelle des poissons. Paris, P. Bertrand, vol. 18. 505 p.

Description and discussion of nomenclature of *E. reticulatus* (le brochet reticulé).

Dalrymple, B. 1968

Sportsman's guide to game fish. New York, Cleveland, World Publ. Co., Outdoor Life Books. 480 p.

Primarily of interest to the angler.

Daly, L. M. 1966 a

Warm water fisheries investigations. Fish population investigations. Massachusetts Div. Fish. Game, D-J Proj. F-27-R-1, Job 2, 13 p.

Daly, L. M. 1966 b

Warm water fisheries investigations. Management histories. Massachusetts Div. Fish. Game, D-J Proj. F-27-R-1, Job 1, 18 p.

Daly, L. M. 1968

Warm water fisheries investigations. Fish population investigation. Massachusetts Div. Fish. Game, D-J Proj. F-27-R-3, Job 2, 4 p.

Davis, J. T. and J. S. Hughes 1968

Investigations of Lake D'Arbonne. Louisiana Wildlife Fish. Comm., Annu. Progr. Rep., D-J Proj. F-12-3, Job 1, p. 35-64.

In summaries of rotenone samples at lakes Anacoco, Bundicks and Chicot, harvestable size chain pickerel varied from 0.0 to 0.67 pounds per acre (0.75 kg/hect.).

Davis, R. M. 1967

Parasitism by newly-transformed anadromous sea lampreys on landlocked salmon and other fishes in a coastal Maine lake. Trans. Amer. Fish. Soc. 96(1):11-16.

Lamprey marks found on chain pickerel in Love Lake.

Davisson, M. T. 1972

Karyotypes of the Teleost family Esocidae. J. Fish Res. Board Canada 29(5):579-582.

Karyotypes of the five surviving species of the esocid family, including *Esox niger*, were compared.

De Jean, J. A. 1951

Some factors affecting the reproduction of the chain pickerel, *Esox niger* LeSueur, in ponds. Alabama Polytech. Inst., M.Sc. diss. 60 p.

Chain pickerel reproduce successfully when stocked alone in ponds ranging in size from 0.08 to 1.6 acres (0.03 to 0.65 hect.), in shallow ponds (maximum depth two feet) (.61 m), as well as deeper ponds (maximum

depth eight feet) (2.4 m), and in still water ponds as well as ponds being fed by streams. Pickerel did not reproduce successfully in a 2.2 acre (0.9 hec.) pond with bluegill and warmouth. Spawning occurred only after a 60°F (15.6°C) temperature at a depth of one foot (0.31 m) was reached.

DeKay, J. E. 1842

Fishes. Part 4, p. 1-415. *In* Zoology of New-York, or the New-York Fauna; comprising detailed description of all the animals hitherto observed within the state of New-York, with brief notices of those occasionally found near its borders, and accompanied by appropriate illustrations. New York Geol. Surv.

Synonymy, characteristics and detailed description of *E. reticulatus* and *E. tredecem-radiatus*. (p. 223-225).

Dequine, J. F. 1950

Management of Florida's fresh-water fisheries. Trans. Amer. Fish. Soc. (1948) 78:38-41.

Listed as a game fish.

De Roche, S. E. 1960

Study of lake trout in Thompson Lake. Comparison of lake trout populations in two Maine lakes. Maine Dep. Inland Fish. Game, D-J Proj. F-13-R-5, 45 p.

De Roche, S. E. and L. H. Bond 1957

The lake trout of Cold Stream Pond, Enfield, Maine. Trans. Amer. Fish. Soc. (1955) 85:257-270.

Esox niger is one of the game species present in Cold Stream Pond.

De Sylva, D. P., F. A. Kalver, Jr. and C. N. Shuster, Jr. 1962

Fishes and ecological conditions in the shore zone of the Delaware River estuary, with notes on other species collected in deeper water. Univ. Delaware Mar. Lab. Infor. Ser., Publ. no. 5, 164 p.

Dineen, J. W. 1966

Everglades impoundment fisheries investigations. Determination of the effects of fluctuating water levels on the fish population in Conservation Area Three. Florida Game Fresh Water Fish Comm., D-J Proj. F-16-R-4, wk. pl. 1, Job E, 14 p.

Dolan, T. 1960

Know your fish. Sports Afield Collect.

Short descriptive paragraph and colour drawing. Primarily of interest to the angler.

Dorchester, J. N. 1961

Basic survey and inventory of fish species in Murvaul Bayou Reservoir. Texas Parks Wildlife Dep., D-J Proj. F-3-R-8, wk. pl. B, Job 13, 18 p.

Dorchester, J. N. 1962

Inventories of Tyler State Park lakes, Dam B. Reservoir, Lake of the Pines, Lake Murvaul, Lake Striker and Caddo Lake. Texas Parks Wildlife Dep., D-J Proj. F-3-R-9, wk. pl. B, Job 18, 30 p.

Doxtater, G. 1967

Experimental predator-prey relations in small ponds. Progr. Fish-Cult. 29(2):102-104.

Five combinations of predator and prey were stocked in ponds varying from 0.5 to 2 acres (0.2 to 0.8 hec.). Chain pickerel, 10-14 inches (254-356 mm) long, were stocked in combination with bluegill at a rate of 30 pounds (13.6 kg) of predator fish to 60 pounds (27.2 kg) of bluegills. Although a high mortality of chain pickerel resulted, indications are that they may be effective in bluegill control.

Dymond, J. R. 1947

A list of the freshwater fishes of Canada east of the Rocky Mountains with keys. R. Ont. Mus. Zool., Misc. Publ. no. 1, 36 p.

Key to species includes *Esox niger*.

Eaton, S. W. and L. P. Kardos 1972

The fishes of Canandaigua Lake, 1971. Sci. Stud. (St. Bonaventure Univ.) 28:23-44.

Capture locations, sex, date of capture, total length, weight, age and stomach contents for each fish collected, including *E. niger*.

Eaton, S. W. and L. J. Moffett 1971

A preliminary study of Canandaigua Lake in 1970. Sci. Stud. (St. Bonaventure Univ.) 27:69-85.

Results of a preparatory study of Lake Canandaigua are given. Chain pickerel is mentioned in a discussion of the literature and has been taken in this lake.

Eddy, S. 1940

Do muskellunge and pickerel interbreed? Progr. Fish-Cult. 48:25-27.

Eddy, S. 1957

How to know the freshwater fishes. Iowa, Wm. C. Brown Co. 253 p.

Identification key.

Eddy, S. and T. Surber 1960

Northern fishes, with special reference to the upper Mississippi Valley. Rev. ed. Massachusetts, C. T. Branford Co. 276 p.

Found in the southern and eastern U.S.

Elser, H. J. and R. Mansueti 1961

Notes on the chain pickerel in Maryland. Maryland Dep. Res. Educ., Chesapeake Biol. Lab. Inland Resour. Div., Solomon, Maryland, 13 p.

18 Maryland impoundments were drained or rotenoned and each impoundment described. Gives geographic distribution, range in Maryland, habitat and habits, commercial catch, size distribution in four populations, reproductive condition, age and growth, ecology, sport fish harvest, stocking records hatcheries and food habits of chain pickerel.

Emboly, G. C. 1915

The farm fish pond. Cornell Reading Courses, Country Life Ser. no. 3:213-252. (N.V.)

Emboly, G. C. 1918

Artificial hybrids between pike and pickerel. J. Hered. 9:253-256.

Esslach, A. R. 1958

Continued evaluation of previous population manipulation work. New Jersey Div. Fish Game, D-J Proj. F-9-R-1, Job 5, 5 p.

Everhart, W. H. 1950

Fishes of Maine. Maine Dep. Inland Fish. Game, 53 p.

Key and notes on distribution, spawning, life history, size, and food. (p. 9, 39)

Everhart, W. H. and L. H. Bond 1953

Maine Lakes. A sportsman's inventory. Maine Dep. Inland Fish. Game, 18 p. (N.V.)

Everhart, W. H. and G. A. Rounsefell 1953

Fishery Science, its methods and applications. New York, Wiley and Sons, Inc. 444 p.

The chain pickerel is listed as a possible substitute for the largemouth bass as the piscivorous species in the bass-bluegill combination in farm ponds. *E. niger* was also considered as being competitive with trout and salmon in Maine lakes.

Evermann, B. W. 1898

Key to the species of *Lucius*. Recreation 9:207.

Evermann, B. W. 1902

Pike, pickerel, masacalonge. Forest Stream 59(10):193.

This account attempts to correct misconceptions that might have arisen as a result of two previous articles on this subject (Anon., 1902 a and b). A key for identification of the species is included.

Evermann, B. W. 1916

Notes on the fishes of the Lumbee River. Copeia no. 36:77-80.

Esox reticulatus is common in the Lumbee River between Blue's Bridge and Turnpike Bridge.

Evermann, B. W. 1918

Notice of collection of fishes from the southern bend of the Tennessee River, Alabama. Amer. J. Sci. Arts 17:297-308, 353-365, 2nd Ser. (N.V.)

Evermann, B. W. and E. L. Goldsborough 1907

A checklist of the freshwater fishes of Canada. Proc. Biol. Soc. Washington 20:89-120.

Distribution of *E. reticulatus* in eastern Canada. (p. 105)

Evermann, B. W. and W. C. Kendall 1896

An annotated list of the fishes known from the state of Vermont. U.S. Comm. Fish Fish. (1894) Rep. 20:579-604.

Evermann, B. W. and W. C. Kendall 1901

Notes on the fishes of Lake Ontario. New York Forest Fish Game Comm., 6th Annu. Rep. (1900):479-488. U.S. Fish Comm. Rep. (1901) 27:209-216.

Faigenbaum, H. M. 1933

Chemical investigations of the Upper Hudson watershed. Sect. 5, p. 157-171. In A biological survey of the Upper Hudson watershed. Suppl. 22nd Annu. Rep., New York Conserv. Dep., Biol. Surv. (1932) no. 7, 341 p.

Chain pickerel were collected during chemical investigations.

Fajen, O. F. 1961

A study of the species composition and relative abundance of fishes present in the Current River. (Work plan no. 9) Missouri Conserv. Comm., D-J

Proj. F-1-R-10, wk. pl. 9, Job 11, 18 p.

Data are presented on total weight and number of fish collected at six Current River stations in the spring and fall of 1960. Chain pickerel were present at three spring stations (5.0 pounds total weight) (2.3 kg) and four fall stations (2.2 pounds total weight) (1.0 kg). Electric seine hauls produced pickerel at two stations.

Farrell, M. A. 1933

Pollution studies of the Upper Hudson watershed. Sect. 6, p. 208-215. In A biological survey of the Upper Hudson watershed. Suppl. 22nd Annu. Rep., New York Conserv. Dep., Biol. Survey. (1932) no. 7, 341 p.

Diagram of Hudson River between Luzern and Troy shows fishes found, including pickerel. (p. 209)

Flemer, D. A. 1959

The food of the chain pickerel, *Esox niger* LeSueur in Tuckahoe Creek, Virginia. Virginia J. Sci. 10(4):263.

Contains food habit data on 64 specimens of *E. niger*. Smaller specimens (less than 74 mm in length) fed on insects 48% of the time and fishes 30% of the time. Larger fish ate primarily fish (63%) and, to a lesser degree, insects (16%).

Foote, L. E. and B. P. Blake 1945

Life history of the eastern pickerel in Babcock Pond, Connecticut. J. Wildlife Manage. 9(2):89-96.

Detailed study of Babcock Pond, Connecticut. Discusses methods of collection, tagging, size and growth, stomach contents, parasites, including tables.

Forelle, F. 1857

On the classification of fishes, with particular reference to the fishes of Canada. Can. Natur. Geol. 1(43):275-283.

Mentions *Esox reticulatus*. (p. 276, 278, 282)

Forste, F. H. 1969

An evaluation of lake trout ice fishing on three New Hampshire lakes. New Hampshire Agr. Exp. Sta., Res. Rep. no. 6, 16 p. (N.V.)

This presents information regarding the characteristics of ice fishermen and their expenditures associated with the sport. Lake trout was the preferred ice fishing species on the three lakes studied. Freshwater burbot, yellow perch, chain pickerel and whitefish were the most popular alternates.

Fowler, H. W. 1906

The fishes of New Jersey. Ann. Rep. New Jersey State Mus. (1905):35-477.

Fowler, H. W. 1907

A supplementary account of the fishes of New Jersey. New Jersey Mus., Annu. Rep., Part 3:251-350.

Fowler, H. W. 1914

Fishes in polluted waters. Copeia no. 5:4.

Esox reticulatus collected in Salem County, New Jersey.

Fowler, H. W. 1916 a

Notes on New Jersey fishes, several new to the states. Copeia no. 27:10-12.

Esox reticulatus collected in Salem County, New Jersey.

Fowler, H. W. 1916 b

Records of northern New Jersey fishes. Copeia no. 31:41-42.

E. reticulatus collected in New Jersey.

Fowler, H. W. 1918 a

Fishes from the middle Atlantic States and Virginia. Univ. Mich. Michigan, Occas. Pap. Mus. Zool. no. 56, 19 p.

Esox reticulatus LeSueur collected in New Jersey and Pennsylvania.

Fowler, H. W. 1918 b

The fishes of Perry County, Pennsylvania. Copeia no. 63:89-91.

E. reticulatus collected at Fishing Run, Pennsylvania.

Fowler, H. W. 1919

A list of the fishes of Pennsylvania. Proc. Biol. Soc. Wash. 32:49-74. (N.V.)

Fowler, H. W. 1921

The fishes of Bucks County, Pennsylvania. Copeia no. 98:62-68.

E. tridecemlineatus collected in Pennsylvania.

Fowler, H. W. 1925

Records of fishes in Pennsylvania 1924. Copeia no. 140:23-24.

E. tridecemlineatus collected in Pennsylvania.

Fowler, H. W. 1927

Notes on fishes in Delaware, 1925-26. Copeia no. 165:90-91.

Esox tridecemlineatus collected in Delaware.

Fowler, H. W. 1935

Notes on South Carolina fresh-water fishes. Charleston Mus. Contrib. no. 7, 28 p.

E. niger listed as a typical coastwise species. Data on collected fishes.

Fowler, H. W. 1945

A study of the fishes of the southern piedmont and coastal plain. Acad. Natur. Sci. Philadelphia, Monogr. no. 7, 408 p.

Fowler, H. W. 1952

A list of the fishes of New Jersey, with off-shore species. Proc. Acad. Natur. Sci. Philadelphia (1952) 104:89-151.

Collection locations for *E. niger*. (p. 100)

Fowler, K. 1903

Mr. Spaeth's pickerel. Forest Stream 60(26):506.

An account of the capture of a four pound (1.8 kg) chain pickerel by a Mr. Spaeth in Green Lake, New Jersey.

Foye, R. E. 1956

Reclamation of potential trout ponds in Maine. J. Wildlife Manage. 20(4): 389-398.

Esox niger was one of 10 species of fish removed from the reclaimed ponds.

Foye, R. E. and M. Scott 1965

Effects of pressure on survival of six species of fish. Trans. Amer. Fish Soc. 94(1):88-91.

Freeman, H. W. 1952

New distribution records for fishes of the Savannah River Basin, South Carolina. Copeia 1952(4):269.

E. niger found in Aiken County and Barnwell County.

Freeman, H. W. 1954

Fishes of the Savannah River project area. Univ. South Carolina, Publ. Ser. 3, Biol. 1 (3):117-156.

One of 48 species that were collected from 103 collecting sites.

Funk, J. L. 1954

Abundance of the fish population in selected areas of study streams. Missouri Conserv. Comm., D-J Proj. F-1-R-3, wk. pl. 2, Job 1, 10 p.

Data is presented on stream migration of fish as determined by census-ing anglers who caught tagged fish. As of January 1, 1955, two tagged chain pickerel were caught.

Funk, J. L. 1955 a

Abundance of the fish population in selected areas of study streams. Missouri Conserv. Comm., D-J Proj. F-1-R-4, wk. pl. 2, Job 1, 13 p.

Funk, J. L. 1955 b

A study of the migration of stream fishes. Missouri Conserv. Comm., D-J Proj. F-1-R-4, wk. pl. 2, Job 2, 3 p.

Gabrielson, I. N., ed. 1963

The fisherman's encyclopedia. 2nd ed. Harrisburg, Pennsylvania, The Stackpole Co. 698 p.

The chain pickerel is the largest pickerel. Cheeks and opercle entirely scaled, while lower half of opercle on northern pike is not scaled and lower half of both cheek and opercle on muskellunge is not scaled. Fish is main diet. Pickerel spawn early and are scatter spawners.

Gallagher, R. J. 1966

Warm water fisheries investigations. Winter Creel census, Cheshire Reservoir. Massachusetts Div. Fish. Game, D-J Proj. F-27-R-1, Job 5, AP3, 3 p.

George, C. J. 1960

Behavioral interactions of the pickerel, *Esox niger* and *Esox americanus* and the mosquito fish, *Gambusia patrualis*. Harvard Univ., Ph.D. diss., 126 p.

Gill, T. N. 1896

The families of syentognathous fishes and their nomenclature. Proc. U.S. Nat. Mus. 18:153-159. (N.V.)

Gill, T. N., ed. 1898

Report in part of Samuel L. Mitchill, M.D., Professor of Natural History, etc., on the fishes of New York. Washington, D.C., 30 p.

Girard, C. F. 1854

Observations upon the American species of the genus *Esox*. Proc. Acad. Natur. Sci. Philadelphia (1853) 6:386.

Compares pike and pickerel and says *E. niger* rescmbls *E. reticulatus*.

Girard, C. 1856

Description of some new species of fish from the state of Massachusetts. Proc. Boston Soc. Natur. Hist. (1854) 5:40-42.

A small specimen, 7 $\frac{5}{8}$ inches (194 mm) long, collected by S. F. Baird, is listed as *Esox ornatus* which Underhill (1948) believed to be the young of either *E. niger* or *E. americanus*.

Goldberger, J. 1911

Some known and three new endoparasitic trematodes from American fresh water fish. Hygicne Lab., U.S. Pub. Health Mar. Hosp. Scrv. Bull. 71:7-35.

Gooch, B. 1967 a

Chilblains and chains. North Carolina Wildlife Resource-o-gram, a roundup of the latest wildlife news, p. 18-19.

An account of winter angling for the chain pickerel in North Carolina, which describes the appearance, habits and preferred bait of the pickerel.

Gooch, B. 1967 b

Pickerel: where and how. Sports Afield, July, 158(1):42,64,65. (N.V.)

Goode, G. B. 1879

Catalogue of the collection to illustrate the animal resources and fisheries of the United States. U.S. Nat. Mus. Bull. no. 14, 351 p.

Esox reticulatus listed and extent of collection at National Museum.

Goode, G. B. 1926

American fishes. A popular treatise upon the game and food fishes of North America with especial reference to habits and methods of capture. Boston, L. C. Page and Co. 562 p.

Gordon, M. 1937

Fishes of eastern New Hampshire. p. 101-118. In E. E. Hoover. A biological survey of the Androscoggin, Saco and Coastal watersheds. New Hampshire Fish Game Comm., Surv. Rep. no. 2, 160 p.

Short general account includes life history, feeding, habits, relationship to trout fishing. Table shows lakes of the Androscoggin, Saco and Coastal watershed in which each fish found.

Gorham, S. W. 1965

Notes on fishes from the Browns Flat area, Kings County, New Brunswick. Can. Field-Natur. 79(2):137-142.

National Museum of Canada catalogue number and location of capture. Brief note on occurrence in the area.

Gorham, S. W. 1970

Distributional checklist of the fishes of New Brunswick. New Brunswick Mus., Saint John, N.B., 32 p.

Brief note on distribution.

Graff, D. R. and L. Sorenson 1970

The successful feeding of a dry diet to esocids. Progr. Fish-Cult. 32(1): 31-35.

An experiment was designed to test feasibility of feeding a hatchery diet to esocids. Attempts to convert chain pickerel, *Esox niger* to a dry diet have met with limited success. Two attempts, with 2,000 and 500 specimens at Benner Spring, failed.

Grantham, B. J. 1962

Detection of sources of stream pollution and its effects upon bottom organisms, fishes and chemical qualities of the water. Completion report of pollution studies on the Leaf River. Mississippi Game Fish Comm., D-J Proj. F-9-R-3, 81 p.

Gray, C. E. 1954

Inventory of the species present in Caddo Lake. Texas Parks Wildlife Dep., D-J Proj. F-3-R-1, wk. pl. B, Job 1, 11 p.

Lists *E. niger* as being present in Caddo Lake, Caddo Lake County.

Gray, C. E. 1955

Inventory of the species present in Caddo Lake. Texas Parks Wildlife Dep., D-J Proj. F-3-R-2, wk. pl. B. Job 1, 17 p.

At four stations (48 collections) on Caddo Lake, the percentage of chain pickerel in the total weight collected varied from 2.77 to 8.40. Twelve seining collections yielded 21 pickerel. Data are presented on 98 pickerel containing food, and length-weight data are given for 127 pickerel.

Gray, J. E. and F. G. Hall 1929

The distribution of sugar in the blood of fishes. J. Elisha Mitchell Sci. Soc. 45(1):142-146. (N.V.)

Greeley, J. R. 1927

Fishes of the Genesee region with annotated list. Sect. 4, p. 47-65. *In* A biological survey of the Genesee River system. New York Conserv. Dep., Suppl. 16th Annu. Rep. (1926), 100 p.

Chain pickerel is considered to be one of the more important food and game fishes of this region. Short note in annotated list gives local distribution, habitat, and stomach contents of 15 inch (381 mm), 11½ inch (292 mm) and 5¾ inch (19 mm) chain pickerel.

Greeley, J. R. 1930

Fishes of the Lake Champlain Watershed. Sect. 2, p. 44-87. *In* A biological survey of the Champlain Watershed. Suppl. 19th Annu. Rep. (1929) New York Conserv. Dep., 321 p.

Listed under the following headings in report: important food and game species; native species of L. Champlain; distribution of fish in L. Champlain Watershed. (p. 45, 71, table 2)

Greeley, J. R. 1938

Fishes of the area with annotated list. P.48-60. *In* A biological survey of the Allegheny and Chemung watersheds. Suppl. 27th Annu. Rep. (1937), New York Conserv. Dep., Biol. Surv. (1937), no. 12, Sect. 2, 287 p.

Gives frequency in the Chemung area. Short note in the annotated list.

Greeley, J. R. 1939

The freshwater fishes of Long Island and Staten Island with annotated list. P. 29-44. *In* Biological survey of the freshwaters of Long Island. Suppl. 28th Annu. Rep. (1938), New York Conserv. Dep., Biol. Surv. (1938) no. 13, 128 p.

Growth data for chain pickerel. Included in annotated list. (p. 36, 38)

Greeley, J. R. 1940

Fishes of the watershed with annotated list. P. 42-81. *In* A biological survey of the Lake Ontario Watershed, including all waters from Little Sandy Creek westward except Genesee and Oswego River Systems. Suppl. 29th Annu. Rep. (1939), New York Conserv. Dep., Biol. Surv. (1939) no. 16, 261 p.

Although chain pickerel is virtually insignificant in the Lake Ontario region, it is said to be present in Little Salmon River drainage and specimens have been taken in Hotel Pond.

Greeley, J. R. and S. C. Bishop 1932

Fishes of the area with annotated list. Sect. 2, p. 54-93. *In* A biological survey of the Oswegatchie and Black River systems, including also the lesser

tributary streams of the upper St. Lawrence River and of north-eastern Lake Ontario. Suppl. 21st Annu. Rep. (1931), New York Conserv. Dep., Biol. Surv. (1931) no. 6, 344 p.

Found in Lake Ontario and St. Lawrence lowlands. Appears in chart of fish distribution of the watershed which includes elevations, regions and subdivisions. Gives description and distribution in Black River drainage system and Oswegatchie drainage. Colour drawing.

Greeley, J. R. and S. C. Bishop 1933

Fishes of the Upper Hudson watershed, with annotated list. Sect. 2, p. 64-101. *In* A biological survey of the Upper Hudson watershed. Suppl. 22nd Annu. Rep. (1932), New York Conserv. Dep., Biol. Surv. (1932) no. 7, 341 p.

Listed throughout the report. Gives local distribution. (p. 65-68, 87, 89)

Green, C. W. 1935

The distribution of Wisconsin fishes. Wisconsin Conserv. Comm. 235 p.

Green, D. M., Jr. 1967

Population survival and growth of sport fish in Dryden Lake. New York Conserv. Dep., D-J Proj. F-17-R-11, Job 3-a, 14 p.

Chain pickerel were sampled by trap nets, hoop nets and electrofishing. Peterson and Schnabel estimates of the fall population were made for bass and pickerel by year classes. Age and growth was determined for bass and pickerel 1+ and older. Angling data is summarized.

Green, D. M., Jr. 1968

Population survival rate and growth of sport fish in Dryden Lake. New York Conserv. Dep., D-J Proj. F-17-R-12, Job 2-a, 17 p.

A creel census on 117.5 acre (47.6 hec) Dryden Lake showed ice fishermen, whose catch was mostly yellow perch and chain pickerel, had the highest catch rate. Boat fishing was more successful than shore fishing for catching largemouth bass and pickerel. Exploitation rates were relatively high for pickerel (.429 and .207).

Green, D. M., Jr. 1970

Population survival rate and growth of sport fish in Dryden Lake. New York Conserv. Dep., D-J Proj. F-17-R-14, Job 3-a, 14 p.

The number and standing crop of the two predator species, largemouth bass and chain pickerel decreased during the five years of the study. The high exploitation rate was a major factor in the pickerel decline.

Green, D. M., Jr. 1971

Population survival rate and growth of largemouth bass in Dryden Lake. New York Dep. Environ. Conserv., D-J Proj. F-17-R-15, Job 3-a, 10 p.

Populations of largemouth bass and chain pickerel were estimated for age 0+ fish for the 1967-1970 year classes and age 1+ fish for the 1965-1969 year classes. Range of populations of 1+ fish were extreme for both bass and pickerel. Variations for age 0+ pickerel was about the same as age 1+ pickerel. Year class strength of pickerel appears to be set by the end of the first summer.

Green, D. M., Jr. 1972

Population survival and growth of largemouth bass in Dryden Lake. New York Dep. Environ. Conserv., D-J Proj. F-17-R-16, Job 3-a, 9 p.

Age 0+ and 1+ bass and pickerel were marked in the fall of 1971 and their populations estimated. A relatively strong year class of young bass and pickerel were produced in 1971. Appears that rapid first year growth enhances survival.

Greene, C. W., R. P. Hunter and W. C. Senning 1933

Stocking policy for streams, lakes and ponds in Upper Hudson watershed. Sect. 1, p. 26-63. In A biological survey of the Upper Hudson Watershed. Suppl. 22nd Annu. Rep. (1932), New York Conserv. Dep., Biol. Surv. (1932) no. 7, 341 p.

Summary of recommendations includes reconsideration of protection of pickerel. Said to be taken in the Batten Kill. (P. 22-24, 46)

Grice, F. 1958

Effect of removal of panfish and trashfish by fyke nets upon fish populations of some Massachusetts Ponds. Trans. Amer. Fish. Soc. (1957) 87:108-115.

The chain pickerel is listed as one of the game fish of the area and is mentioned throughout the report.

Grice, F. 1959

Elasticity of growth of yellow perch, chain pickerel and largemouth bass in some reclaimed Massachusetts waters. Trans. Amer. Fish. Soc. 88(4):332-335.

After reclamation by rotenone in warmwater ponds and lake, growth rates of yellow perch, chain pickerel and largemouth bass were more rapid than under natural conditions. Rate of growth appeared to be more dependent upon population density than upon length of growing season or other factors.

Grice, F. 1962

Statewide reclamations. To reclaim eighteen ponds and two streams for both warm water and cold water species. Massachusetts Div. Fish Game, D-J Proj. F-18-D-1, 2 p.

Grosvenor, M. M., ed. 1965

The wondrous world of fishes. Washington, Nat. Geographic Soc. 367 p.

Short note on food, characteristics, range, length and weight. Drawing.

Gumtow, R. E. 1956

A study of the composition and relative abundance of the fish population in selected areas of study streams. Missouri Conserv. Comm., D-J Proj. F-1-R-5, Job 1, 37 p.

Günther, A. 1866

Catalogue of the Physostomi, containing the families Salmonidae, Percopidae, Galaxidae, Mormyridae, Gymnarchidae, Esocidae, Umbridae, Seombresocidae, Cyprinodontidae, in the collection of the British Museum, London, vol. 6, 368 p.

Short description and synonymy of *Esox reticulatus* and *Esox niger*.

Hackney, P. A. 1968

Two species of pike found in Alabama waters. Alabama Conserv. 38(3):6-7.

Two members of the genus *Esox* are found in Alabama, *E. niger* and *E. a. americanus*. Chain pickerel are known as "jack" or "jackfish". They are considered desirable predators in natural waters. The chain pickerel has not been as popular in southeast as in northeast.

Haley, A. J. and H. S. Winn 1959

Observations on a Lernaeen parasite of freshwater fishes. Trans. Amer. Fish. Soc. 88(2):128-129.

Incidence of *L. cyprinacea*. Also number of copepodid larvae.

Halkett, A. 1913

Check list of the fishes of the Dominion of Canada and Newfoundland. Ottawa, C. H. Parmelee, King's Printer. 138 p.

Lists *Lucius reticulatus* Le Sueur and briefly describes range. Black and white illustration. (p. 68)

Halnon, L. C. 1959

Fisheries investigations of Lake Champlain and other waters. Investigation of the effect of a season for shooting northern pike during spawning. Vermont Fish Game Dep., D-J Proj. F-1-R-7, Job 2, 14 p.

Hambly, L. S. 1966 a

Quabbin Reservoir investigations. Creel census. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-12, Job 1, 17 p.

Hambly, L. S. 1966 b

Quabbin Reservoir investigations. Population studies. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-12, Job 2, 7 p.

Hambly, L. S. 1967 a

Quabbin Reservoir investigations. Age and growth study. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-13, wk. pl. 1, Job 2, 2 p.

Hambly, L. S. 1967 b

Quabbin Reservoir investigations. Creel census. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-13, wk. pl. 1, Job 1, 12 p.

Hambly, L. S. 1968 a

Quabbin Reservoir investigations. Age and growth study. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-14, wk. pl. 1, Job 2, 3 p.

Hambly, L. S. 1968 b

Quabbin Reservoir investigations. Creel census. Massachusetts Div. of Fish. Game, D-J Proj. F-6-R-14, wk. pl. 1, Job 1, 13 p.

Harmic, J. L. 1962

The chain pickerel. *Esox niger*. Delaware Board Game Fish Commrs., Suppl., Delaware Conservationist, 2 p.

Brief account includes mention of spawning, food, habitat, merits.

Harrington, R. W., Jr. 1947

The breeding behavior of the bridled shiner, *Notropis bifrenatus*. Copeia 1947(3):186-192.

Notropis bifrenatus is a forage fish for *Esox niger*.

Harvey, K. A. 1953

Operation of two-way fish weir. Maine Dep. Inland Fish. Game, p. 1-9. (mimeo) (N.V.)

Hazzard, A. S., K. Buss and J. Miller (no date)

Pennsylvania Fishes. Pennsylvania Fish Comm. Publ., 32 p.

For the fishes of Pennsylvania, including *E. niger*, there is a short descriptive note with colour illustration. Gives distinguishing features and drawing to show differences.

Henshall, J. A. 1903

Bass, pike, perch and others. London and New York, The Macmillan Co. 410 p.

Henshall, J. A. 1919

Bass, pike, perch and other game fishes of America. New ed. Cincinnati, Stewart and Kidd Co. 410 p.

Taxonomic description and key for *Esox reticulatus*, eastern pickerel. Gives other common names, range, description, extensive note on angling including suggestions for bait and lures. Small black and white figure. (p. 121, 122, 149-153)

Herbert, H. W. 1859

Frank Forester's fish and fishing of the United States and British provinces of North America. New York, G. E. Woodward. 512 p.

Consideration of *Esox reticulatus*, the common pickerel, including range, size limit, description and distinguishing features. Drawing.

Herke, W. H. 1959

Comparisons of the length-weight relationship of several species of fish from two different, but connected habitats. Proc. 13th Annu. Conf., Southeastern Ass. Game Fish Commr. p. 299-313.

Hildebrand, S. F. 1924

Annotated list of fishes collected in vicinity of Augusta, Georgia, with description of a new darter. Bull. U.S. Bur. Fish., 39: 1-8.

Fish specimens were collected during the spring and summer of 1918 and summers of 1921 and 1922. Chain pickerel were collected only from Sweetwater Creek, Edgefield County, South Carolina, and in a pond on the same creek.

Hildebrand, S. F. and W. C. Schroeder 1928

Fishes of Chesapeake Bay. U.S. Bur. Fish. Bull. 43(1), Doc. no. 1024, 366 p.

Short key for *Esox reticulatus*. Detailed taxonomic description including various body measurements, colour, size, diagnostic differences from banded pickerel, and changing characteristics of young. General information given on feeding habits, habitat, spawning, fishing yield and range. Chesapeake collection localities.

Hoffman, C. H. and E. W. Surber 1948

Effects of an aerial application of wettable DDT on fish and fish-food organisms in Black Creek, West Virginia. Trans. Amer. Fish. Soc. (1945) 75:48-58.

One of the less commonly found species. (p. 50)

Hoffman, G. L. 1967

Parasites of North American freshwater fishes. Berkeley and Los Angeles, Univ. California Press. 486 p.

A comprehensive treatise on North American freshwater fish parasites that includes a list of 34 parasites for which *E. niger* is a host.

Holbrook, J. E. 1860

Ichthyology of South Carolina. 2nd ed. Cambridge, vol. 1. 205 p.

Original description of *Esox affinis* a synonym of *Esox niger*.

Holder, D. R. 1969

Statewide fisheries investigation. Applied management in warmwater streams. Survey and inventory. Georgia Game Fish Comm., D-J Proj. F-21-R-1, wk. pl. 6, Job 1, p. 10-16, 23-32, 40-41.

Holder, D. R. 1970

A study of fish movements from the Okefenokee Swamp into the Swanee River. Proc. Annu. Conf. Southeastern Ass. Game Fish Commr. 24:591-608. (N.V.)

Hoover, E. E. 1937

Methods of stream and lake analysis. Appendix, p. 128-151. *In* E. E. Hoover. Biological survey of the Androscoggin, Saco and Coastal watersheds. New Hampshire Fish Game Comm., Surv. Rep. no. 2, 160 p.

Gives environmental requirements such as temperature, pH, oxygen, carbon dioxide, food, spawning grounds, time of spawn, cover, bottom.

Hubbs, C. 1972

A checklist of Texas freshwater fishes. Texas Parks Wildlife Dep., Tech. Ser. no. 11, 11 p.

Listed as a Texas fish. Gives outline of game areas.

Hubbs, C. L. 1926

A check-list of the fishes of the Great Lakes and tributary waters, with nomenclatorial notes and analytical keys. Univ. Michigan, Mus. Zool. Misc. Publ. no. 15, 77 p.

Key and short note on nomenclature.

Hubbs, C. L. 1955

Hybridization between fish species in nature. Syst. Zool., 4(1):1-20.

Hybridization in the genus *Esox* is rather common in nature. Only the species most nearly equal in size seem to cross such as *E. niger* and *E. americanus*.

Hubbs, C. L. and E. R. Allen 1943

Fishes of Silver Springs, Florida. Proc. Florida Acad. Sci. 6:110-130.

Specimens observed and collected. Note on habits. (p. 122)

Hubbs, C. L. and K. F. Lagler 1964

Fishes of the Great Lakes region. With a new preface. Ann Arbor, Univ. Michigan Press. 213 p.

Range of the chain pickerel is outlined as Nova Scotia south to Florida, west to Texas and north to northeastern Texas, southern Missouri and the Tennessee River system in Alabama.

Huish, M. T. 1956

Fish management investigations. Effect of fish removal and other factors upon remaining fish populations at Newnans Lake Florida. Florida Game Fresh Water Fish Comm., D-J Proj. F-5-R-3, wk. pl. 1, Job E, SP1, 39 p.

Hunter, G. W. III 1942

Studies on the parasites of fresh water fishes of Connecticut. Sect. 4, p. 228-288. *In* A fishery survey of important Connecticut lakes. Publ. Doc no. 47, Connecticut Geol. Natur. Hist. Surv., Bull. no. 63, 339 p.

Data on parasites found infecting 53 chain pickerel from 9 lakes. Lists chain pickerel parasites as common, occasional or rare. (p. 251, 266, 281)

Hunter, G. W. III and W. S. Hunter 1931

Studies on fish parasites in the St. Lawrence Watershed. Sect. 10, p. 197-216. In A biological survey of the St. Lawrence Watershed. New York Conserv. Dep. Suppl., 20th Annu. Rep. (1930), 261 p.

Esox niger may act as a second intermediate host for *P. ambloplitis* and when young fish carrying this parasite in their body cavity are eaten by any of the definitive hosts, the plerocercoid larvae are brought to the digestive tract and there develop to sexual maturity.

Hunter, G. W. III and J. S. Rankin, Jr. 1939

The food of the pickerel. Copeia 1939(4):194-199.

Data on pickerel (*E. niger* and *E. americanus*) were combined. Pickerel under six inches (152 mm) in length fed mainly on Crustacea and those over six inches fed mainly on fish. This generally agreed with a review of the literature, except that in the literature, Insecta was most commonly taken by young pickerel.

Hunter, G. W. III and J. S. Rankin, Jr. 1940

Parasites of northern pike and pickerel. Trans. Amer. Fish. Soc. (1939) 69:268-272.

Identification of parasites infesting chain pickerel, *E. niger*. All those fish greater than 9 cm long were hosts to various species of parasites. 37 *E. niger* from Lake Pocotopaug were examined. The fish from Connecticut Lake harbour fewer species of parasites than those in waters in New York. Such differences may be correlated with changes occurring during the last glaciation.

Hutt, A. 1967

The chain pickerel. Is it a pest — or a prize — this long-jawed eating machine? Florida Wildlife 20(2):16-19.

This paper describes various aspects related to angling. It includes a general description of the life history, voracity of appetite and other attributes of this fish.

Incerpi, A. 1964

Populations studies—lakes. Maine Dep. Inland Fish Game, D-J Proj. F-8-R-12, Job 2, 4 p.

Presents weekend ice fishing creel census data from Nickerson Lake and Drews Lake during February and the first week in March, 1964. Lake trout have been newly established, and brook and brown trout are the other coldwater game fish present. Chain pickerel provide a limited warmwater fishery.

Jackson, C. F. 1963

Laboratory analyses of fish and game and their foods. Species identification by means of chromatography. New Hampshire Fish Game Dep., D-J Proj. FW-2-R-11, Job 5, PT1, 4 p.

Jenkins, R. E., E. A. Lachner and F. J. Schwartz 1970

Fishes of the central Appalachian drainages: their distribution and dispersal. P. 43-117. In P. C. Holt, ed. The distributional history of the biota of the southern Appalachians. Part 3. Vertebrates. A Symposium. Virginia Polytechnic Inst. and State Univ., Res. Monogr. no. 4, 306 p.

Presents and discusses the species composition of each of the drainages in the Atlantic slope and Ohio basin areas, based on the results of this study and the literature. Indicates whether species are native or introduced.

Jerome, W. C. 1962 a

Chain pickerel (*Esox niger*) mortality investigations. New Hampshire Fish Game Dep., D-J Proj. F-11-R-1, Job 2, 12 p.

Chain pickerel mortality studies in 1960 and 1961 indicated that while in normal processing (weighing, measuring and scale sampling, without an anaesthetic) mortality is relatively high (10%) shocking and transportation mortality (5%) and hooking mortality (8%) are insignificant.

Jerome, W. C. 1962 b

The effect of ice-fishing on a chain pickerel (*Esox niger*) population with little or no competition. New Hampshire Fish Game Dep., D-J Proj. F-11-R-1, Job 4, 1 p.

A pond for this phase of the study was sought but two ponds investigated did not prove suitable.

Johnston, K. H. 1962

Statewide fish management investigations. Removal of longnose gar from rivers and streams with the use of dynamite. North Carolina Wildlife Resour. Comm., D-J Proj. F-14-R-2, wk. pl. 4, Job A, SP, 5 p.

Jordan, D. S. 1882

Report on the fishes of Ohio. Sect. 4, p. 785-1002. *In* Ohio Geol. Surv. Rep., Vol. 4, Zoology and Botany, Part 1, Zoology. 1020 p.

Compares some features of *Esox reticulatus* with those of the little pickerel. (p. 914)

Jordan, D. S. 1884

Manual of the vertebrates of the northern United States, including the district east of the Mississippi River, and north of North Carolina and Tennessee, exclusive of marine species. 4th ed. Chicago, Jansen, McClurg and Co. 406 p.

Description and distribution of *E. reticulatus*.

Jordan, D. S. 1889

Six species of North American freshwater fishes. Smithsonian Inst.: 1-18.

Jordan, D. S. 1905

A guide to the study of fishes. New York, Henry Holt and Co., 2 vols. 427 p.

Short account of the eastern North American species including *Esox reticulatus*. (p. 190, 193)

Jordan, D. S. 1917

Concerning Rafinesque's précis des découvertes somiologiques. Proc. Acad. Natur. Sci. Phil. 69:276-278.

Jordan claimed that Rafinesque's 1814 paper described the pike *Esox lucius* under the name *E. reticulatus* thereby invalidating Lesueur's 1818 use of *E. reticulatus* for the chain pickerel. Jordan suggested that *E. tredecimlineatus* Mitchill 1852, should stand.

Jordan, D. S. 1918

Name of the pickerel. Copeia no. 61:81.

Suggested various changes in nomenclature including changing the name of the common eastern grass pickerel from *Esox reticulatus* LeSueur to *Esox tridecemlineatus* Mitchill. Also says Mitchill's name given to species which

he called federation pike due to count of 13 dorsal, anal and branchiostegal rays.

Jordan, D. S. 1925

Fishes. Rev. ed. New York, London, D. Appleton and Co. 773 p.

Short account of the eastern North American species of *Esocidae*. Mentions *E. tridecemlineatus*.

Jordan, D. S. 1929

A manual of the vertebrate animals of the northern United States, including the district north and east of the Ozark mountains, south of the Laurentian Hills, north of the southern boundary of Virginia, and east of the Missouri River, inclusive of marine species. 13th ed. Chicago, Jansen, McClurg and Co. 446 p.

Description and range.

Jordan, D. S. and H. E. Copeland 1876

Check list of the fishes of the fresh waters of North America. Bull. Buffalo Soc. Natur. Hist.: 133-164.

Jordan, D. S. and B. W. Evermann 1896 a

A check-list of the fishes and fish-like vertebrates of north and middle America. U.S. Comm. Fish Fish., Rep. Commr. (1894-1895) 21:207-584. (Revised edition 1930 by Jordan, Evermann and Clark)

Jordan, D. S. and B. W. Evermann 1896 b

The fishes of North and Middle America. A descriptive catalogue of the species of fish-like vertebrates found in the waters of North America, north of the Isthmus of Panama. Bull. U.S. Nat. Mus. no. 47, Part I. 954 p.

Presents a taxonomic description of *E. niger* (referred to as *Lucius reticulatus*) as well as its distribution. (p. 627, 628)

Jordan, D. S. and B. W. Evermann 1923

American food and game fishes. A popular account of all the species found in America north of the equator, with keys for ready identification, life histories and methods of capture. Garden City, N.Y., Doubleday, Page & Co. 574 p.

A popular account of all species found in America north of the equator, with keys for ready identification, notes on distribution and capture locations, life histories and methods of capture.

Jordan, D. S., B. W. Evermann and H. W. Clark 1930

Check list of the fishes and fishlike vertebrates of North and Middle America, north of the northern boundary of Venezuela and Colombia. U.S. Comm. Fish., Rep. for the fiscal year 1928, Part 2, Appendix 10, Doc. no. 1055 (1930) 670 p.

Synonymy of *Esox niger*, contains errors.

Jordan, D. S. and C. H. Gilbert 1883

A synopsis of the fishes of North America. Bull. Nat. Mus. 16:1-1018.

Concise description and synonymy.

Karvelis, E. G. 1964

The true pikes. U.S. Fish Wildlife Serv., Fish. Leaf. no. 569, 11 p.

Although no specific taxonomic characters are mentioned, there is a key and notes on nomenclature and distinguishing characters. Brief life history notes are given for *E. niger*.

Kearson, L. L. 1969

Statewide fisheries research. River basin studies. Effects of stored pulp-mill wastes releases upon Chowan River fishes. North Carolina Wildlife Resour. Comm., D-J Proj. F-19-R-1, wk. pl. 9, Job B, 19 p.

Keith, W. E. and S. W. Barkley 1971

Predation on stocked rainbow trout by chain pickerel and largemouth bass in Lake Quachita, Arkansas. Proc. 24th Annu. Conf. Southeastern Ass. Game Fish Commr.:401-407.

Predation by largemouth bass and chain pickerel was heavy on rainbow trout stocked in an established fish population in Lake Quachita. Of 21 pickerel 15 inches (381 mm) and over, 54.5% had consumed trout. Although the average size trout stocked was nine inches (229 mm), 79.6% of the trout consumed by pickerel and bass were eight inches (203 mm) or less.

Kemp, R. 1952

The fishes of Texas. The pickerel. Texas Game Fish Comm., June:27.

Two members of pike family are found in Texas, *E. niger* and *E. vermiculatus*. The chain pickerel is preferred because it grows larger. They are easily caught on a variety of lures and baits.

Kemp, R. J. 1954

Basic survey of those portions of the Little Cypress, Cypress and Black Cypress Bayous or Creeks which lie within Marion County. Texas Parks Wildlife Dep., D-J Proj. F-3-R-1, wk. pl. A, Job 1, 6 p.

Lists *E. niger* as occurring in a survey in the Red River Basin of Marion County.

Kendall, W. C. 1895

Notes on freshwater fishes of Washington County, Maine. Bull. U.S. Fish Comm. 14:43-54.

Specimen of *Lucius reticulatus* were obtained from several lakes and rivers.

Kendall, W. C. 1908

Fauna of New England. List of pisces. Occas. Pap. Boston Soc. Natur. Hist. no. 7, 152 p.

Kendall, W. C. 1913

Fishes and fishing in Sunapee Lake. Bull. U.S. Bur. Fish., Doc. no. 783, 96 p.

Note on *Esox reticulatus* discusses feeding habits, habitat, effect on other fishes, spawning and early growth, and gives some reasons for decrease in population. (p. 22)

Kendall, W. C. 1917

The pikes: their geographical distribution, habits, culture and commercial importance. Appendix 5, Rep. U.S. Commr. Fish. 1917, Bur. Fish. Doc. no. 853, 45 p.

Quite complete discussion on *Esox reticulatus*, eastern pickerel: geographical distribution, characteristics, size, habitat, habits, food and feeding, breeding, rate of growth, qualities as a food fish.

Kendall, W. C. 1918

The Rangeley lakes, Maine, with special reference to the habits of the fishes, fish culture and angling. Bull. U.S. Bur. Fish., (1915-1916) 35: 485-594.

Data are given on distribution, life history and management. The author

implied that an increasing pickerel population had not caused the decline of trout in Umbagog Lake.

Kendall, W. C. and E. L. Goldsborough 1908

The fishes of the Connecticut lakes and neighbouring waters, with notes on the plankton environment. U.S. Bur. Fish., Rep. Commr. Fish, Doc. no. 633, 77 p.

Kendle, E. R. 1962

Small impounded lakes investigation. Nebraska Game Forest. Parks Comm., D-J Proj. F-4-R-7, Job 11, 7 p.

Kendle, E. R. 1963

Small impounded lakes investigations. Nebraska Game Forest. Parks Comm., F-4-R-8, Job 11, p. 11-21.

Kendle, E. R. and K. Donoho 1961

Small impounded lakes investigation. Nebraska Game Forest. Parks Comm., D-J Proj. F-4-R-6, Job 11, 8 p.

King, W. 1947

Important food and game fishes of North Carolina. North Carolina Dep. Conserv. Dev., Div. Game Inland Fish.:7-54.

Key and account under these headings; common names, description, distribution, natural history, angling and conservation. Black and white photo. (p. 7, 9, 22)

Kircheis, F. W. 1968

Pond surveys. Rhode Is. Div. Fish Game, D-J Proj. F-20-R-9, Job 11, 18 p.

Kirkland, A. L. 1963

Statewide reservoir investigations. Evaluation of special netting regulation on Lake Seminole. Georgia Game Fish Comm., D-J Proj. F-14-R-1, Job 8, 5 p.

Kirtland, J. P. 1844

Descriptions of the fishes of Lake Erie, the Ohio River and their tributaries. Boston J. Natur. Hist. (1843-1844) 4:231-240.

Synonymy and description of *Esox reticulatus*. Drawing.

Kirtland, J. P. 1854

Revision of the species belonging to the Genus *Esox*, inhabiting Lake Erie and the River Ohio. Ann. Sci. 2(3):78-79. (N.V.)

Recognizes *E. nobilis* as the muskellunge of the fisherman and *E. estor* as the northern pike of the fisherman. States that *E. nobilis* and *E. estor* inhabit Lake Erie and some of its tributaries.

Knapp, F. T. 1951

Additional reports of lampreys from Texas. Copeia 1951(1):87.

Ichthyomyzon castaneus found on a chain pickerel in Texas, 1950.

Knapp, F. T. 1953

Fishes found in the freshwaters of Texas. Brunswick, Georgia, Ragland Studio Litho Printing Co. 166 p.

Key, distribution and black and white sketch. (p. 37, 38)

Krueger, W. H. 1961

Meristic variation in the fourspine stickleback, *Apeltes quadracus*. Copeia 1961(4):442-450.

Collected with *Apeltes quadracus* in Massachusetts.

Kuhne, E. R. 1939 a

A guide to the fishes of Tennessee and the mid-south. Tennessee Div. Game Fish, Dep. Conserv., 124 p.

Gives common names, description. (p. 70)

Kuhne, E. R. 1939 b

Tennessee's fisheries program. Trans. Amer. Fish Soc. (1938) 68:240-245.

Esox niger is one of 5 different fishes known as "Jacks" in Tennessee.

Lagler, K. F. 1956

Freshwater fishery biology. 2nd ed. Dubuque, Iowa, W. C. Brown Co. 421 p.

A brief description is given of the pickerels — chain, redbfin, and grass. Chain pickerel are economically classified as sport and coarse food fish.

Lambou, V. W. 1959

Fish populations of backwater lakes in Louisiana. Trans. Amer. Fish. Soc. 88(1):7-15.

Taken by rotenone sampling. (p. 10, 13)

La Monte, F. 1945

North American game fishes. Garden City, New York, Doubleday, Doran Co., Inc. 202 p.

Distribution, colour, size, food and habits. Black and white drawing. (p. 128)

Lamonthe-Cadillac, M. 1692

Memoir on Acadia, New England, New York and Virginia. Extracts from the Memoirs of M. Lamonthe-Cadillac respecting Acadia, New England, New Netherland and Virginia. New York History Collection 9:546-550.

LaRue, G. R. 1914

A revision of the Cestode family Proteocephalidae. Illinois Biol. Monogr. 1(1,2): 1-350.

Lawrence, J. M. 1960

Estimated sizes of various forage fishes chain pickerel can swallow. Proc. 14th Annu. Conf., Southeastern Game Fish Commr., p. 257-258.

This study concluded that chain pickerel can swallow another species of fish whose body depth is equal to, or less than, its own body depth when the abdomen is not distended.

Leach, G. C. 1927

Artificial propagation of pike perch, yellow perch and pikes. Appendix 1, Rep. U.S. Commr. Fish Doc. no. 1018:1-27.

Figure of *E. decimlineatus*. Distribution and weight of *E. reticulatus* as well as notes on feeding and artificial propagation of pickerel in general. (p. 23, 25, 27)

Legendre, V. 1954 a

Key to game and commercial fishes of the province of Quebec. The freshwater fishes, vol. 1. Quebec Game Fish. Dep. 180 p.

Quebec distribution map and key.

Legendre, V. 1954 b

Les poissons d'eau douce. Clef des poissons de pêche sportive et commerciale de la province de Québec. 2e éd. Québec, Min. Chasse et Pêche. 180 p.

Leidy, J. 1889

Parasites of the pickerel. Proc. Acad. Natur. Sci. Philadelphia (1888) 40:169.

A species of *Taenia* (which resembles *Taenia ambloplitis* noticed in *Ambloplitis rupestris*) appears to be common in the intestine and stomach of *E. reticulatus*. Gives detailed description of *Taenia* parasite which is called *Taenia leptosoma*.

Leidy, J. 1904

Researches in Helminthology and Parasitology. Smithsonian Misc. Coll. 46:1-281.

Lesueur, C. A. 1818

Description of several new species of the genus *Esox*, of North America. J. Acad. Natur. Sci. Philadelphia 1 (2):413-417.

Original descriptions of *E. reticulatus* and *E. niger*.

Lewis, G. E. 1971 a

A food habits study of chain pickerel, *Esox niger* LeSueur in Patterson Creek, West Virginia. West Virginia Dep. Natur. Resour., 22 p.

A total of 117 chain pickerel stomachs was collected. Some feeding occurs throughout the 24-hour period. Abundance of a species seemed to be the main factor in determining what was eaten. Pickerel less than 140 mm standard length fed mainly on insects while larger pickerel fed largely on fish.

Lewis, G. E. 1971 b

Life history of the chain pickerel, *Esox niger* LeSueur, in West Virginia with emphasis on age and growth. West Virginia Univ., M.Sc. diss., 93 p.

Presents results, statistical analysis and conclusions drawn from a study on the life history of the chain pickerel in an 18 mile (29 km) section of Patterson Creek, West Virginia (March 29th-Nov. 6th, 1969). The following aspects were emphasized: relationship of water temperature and age of fish to spawning, food source, body length relation to scale measurements (scale samples taken from dorsal, pectoral, and caudal arcas), determination of annuli, correlation between otolith diameter and body length.

Lindenberg, J. G. 1970

Warmwater fisheries investigations. Evaluation of landlocked alewives in Congamond Lakes. Massachusetts Div. Fish. Game, D-J Proj. F-35-R-2, wk. pl. 1, Job 1, 8 p.

Livingstone, D. A. 1953

The freshwater fishes of Nova Scotia. Proc. Nova Scotian Inst. Sci. (1950-1951) 23(1):90 p.

Gives other common names, range, occurrence in Nova Scotia, and description. (p. 53-54)

McAtee, W. L. and A. C. Weed 1915

First list of the fishes of the vicinity of Plummers Island, Maryland. Proc. Biol. Soc. Washington 28:1-14.

Esox reticulatus appears in the annotated list and is said to be of occasional occurrence in the canal.

McCabe, B. C. 1943

An analysis of the distribution of fishes in the streams of western Massachusetts. Copeia 1943(2):85-89.

Probable early postglacial distribution and present distribution.

McCabe, B. C. 1952

Fisheries report for lakes of northeastern Massachusetts, 1949. Massachusetts Div. Fish. Game, 115 p.

McCabe, B. C. 1953

Fisheries report for lakes and ponds of north central Massachusetts, 1950. Massachusetts Div. Fish. Game, 122 p.

McCabe, B. C. 1958

Esox niger LeSueur. Tabular treatment of the life history and ecology of the chain pickerel. Nat. Acad. Sci. Comm. Handb. Biol. Data, 45 p.

Synopsis of most of the information available on the chain pickerel. Subjects included are taxonomy, nomenclature, distribution, associations (tabulated references), description, food and feeding (table showing stomach contents of 104 young chain pickerel from Lincoln Pond, New York, table of selectivity of food), growth (tables presenting length and weight at various ages), reproduction, embryonic development, hybridization, behaviour, populations, diseases and list of parasites, predators and competitors, fisheries methods and management.

McCabe, B. C. and A. H. Swartz 1952

Fisheries report for lakes of Barnstable County, Berkshire County, and Plymouth County, 1946-1948. Massachusetts Div. Fish. Game, 269 p.

McCaig, R. S. 1957

Quabbin Reservoir Studies — 1956. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-3, 22 p.

McCaig, R. S. 1958

Quabbin Reservoir investigations. Massachusetts Div. Fish. Game. D-J Proj. F-6-R-4, 60 p.

McCaig, R. S. 1962 a

Harvest studies on managed ponds. Central Massachusetts census. Comet Pond. Chauncey Pond. Bartlett Pond. Little Chauncey Pond. Massachusetts Div. Fish. Game, D-J Proj. F-10-R-5, Job 1, 22 p.

McCaig, R. S. 1962 b

Quabbin Reservoir investigations. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-8, 14 p.

McCaig, R. S. 1963 a

Quabbin Reservoir investigations. Computation of data. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-9, Job 3, 11 p.

McCaig, R. S. 1963 b

Quabbin Reservoir investigations. Creel census. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-9, Job 1, 3 p.

McCaig, R. S. 1964 a

Quabbin Reservoir investigations. Compilation of data. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-10, Job 3, 16 p.

McCaig, R. S. 1964 b

Quabbin Reservoir investigations. Creel census. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-10, Job 1, 6 p.

McCaig, R. S. 1964 c

Quabbin Reservoir investigations. Population studies. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-10, Job 2, 2 p.

McCaig, R. S. 1964 d

Harvest studies on managed ponds. Central Massachusetts census. Little Chauncey pond. Bartlett pond. Chauncey pond. Massachusetts Div. Fish. Game, D-J Proj. F-10-R-7, Job 1, 15 p.

McCaig, R. S. 1966 a

Connecticut River harvest and population study. Creel census. Massachusetts Div. Fish. Game, D-J Proj. F-25-R-2, Job 1, 17 p.

McCaig, R. S. 1966 b

Connecticut River harvest and population study. Fish population sampling. Massachusetts Div. Fish. Game, D-J Proj. F-25-R-1, Job 2, 25 p.

McCaig, R. S. 1966 c

Connecticut River harvest and population study. Fish population sampling. Massachusetts Div. Fish. Game, D-J Proj. F-25-R-2, Job 2, 13 p.

McCaig, R. S. 1967

Harvest studies on managed ponds. Central Massachusetts census. Comet Pond. Chauncey Pond. Little Chauncey Pond. Bartlett Pond. Massachusetts Div. Fish. Game, D-J Proj. F-10-R-6, Job 1, 16 p.

McCaig, R. S. and J. W. Mullan 1960

Growth of eight species of fishes in Quabbin Reservoir, Massachusetts, in relation to age of reservoir and introduction of smelt. Trans. Amer. Fish. Soc. 89(1):27-31.

Growth of chain pickerel increased after smelt were introduced. (P. 30, fig. 1)

McCarraher, D. B. 1960

Pike hybrids (*Esox lucius* x *E. vermiculatus*) in a sandhill lake, Nebraska. Trans. Amer. Fish. Soc. 89(1):82-83.

Quotes older papers on hybrids involving *E. niger*.

McCarraher, D. B. 1965

Chain pickerel. Outdoor Nebraska Land, August:58-59.

Chain pickerel have recently been introduced into Nebraska. They can tolerate a wider range of environmental conditions than many game fish. Chain pickerel may grow better than northern pike in small impoundments. Pickerel are solitary fish. They reach a desirable angling size and are good eating. They may prove to be an important predator in small impoundment management.

McClane, A. J. 1947

Snakes alive. Field Stream 52(4):58-62.

McClane, A. J. 1961

The pike family. Field Stream, June:40-47, 89-92.

Distribution in the U.S. (Small map) Suggested angling locations and methods.

McClane, A. J., ed. 1965

McClane's standard fishing encyclopedia and international angling guide. New York, Holt, Rinehart and Winston. 1057 p.

The chain pickerel is a popular game fish in the eastern and southern United States. The chain-like pattern is distinctive. They provide a year-round fishery. Most are taken by bass and walleye fishermen. Use light lures and outfits for most sporting fishing.

McClelland, W. G. 1960

Channel catfish studies. Texas Parks Wildlife Dep., D-J Proj. F-8-R-6, wk. pl. B, Job 17, 32 p.

McIlwain, T. D. 1970

Stomach contents and length-weight relationships of chain pickerel (*Esox*

niger) in south Mississippi waters. Trans. Amer. Fish. Soc. 99(2):439-440.

Data are presented on 108 *E. niger* with a range in total length of 301-565 mm. Collected from five rivers at distances up to 15 miles (24.1 km) from the Gulf Coast. From 58 pickerel stomachs with food, frequency of occurrence of fish items was 96.5. A preference was shown for spiny-rayed fish, with 38.8% of the identifiable fish being centrarchids. Length-weight regression coefficients of *E. niger* from Mississippi and New York are compared.

Mairs, D. F. 1968

Maine water quality investigations. Maine Dep. Inland Fish. Game, D-J Proj. F-19-R-5, Fin., 17 p.

Mansueti, A. J. and J. D. Hardy, Jr. 1967

Development of fishes of the Chesapeake Bay Region. An atlas of egg, larval, and juvenile stages. Natur. Resour. Inst., Univ. Maryland. 202 p.

Comprehensive notes and figures on developmental stages of *Esox niger* with separate notes on each stage: egg, yolk sac larvae, larvae, pre-juveniles and juveniles. Also gives a comprehensive taxonomic description of adults (including vertebrae), notes on distribution, ecology (including habitat of adults, larvae and juveniles), and spawning.

Mansueti, A. J. and R. J. Mansueti 1955

Eggs, larvae and juveniles of chain pickerel reared successfully. Maryland Tidewater News 12(6):1-2.

Mansueti, R. 1951

Occurrence and habitat of the darter *Hopolepis fusiformes erochrous* in Maryland. Copeia 1951(4):301-302.

Found in close association with *Hopolepis erochrous* (= *Etheostoma*).

Mansueti, R. J. 1962

Checklist of fishes of the Patuxent River drainage and of Chesapeake Bay off Calvert County, Maryland. Maryland Univ. Natur. Resour. Inst., Chesapeake Biol. Lab. June, ref. no. 62-36, 5 p. (mimeo)

Esox niger appears in the checklist. Brief note on habitat.

Mansueti, R. and H. J. Elser 1953

Ecology, age and growth of the mud sunfish, *Acantharchus pomotis* in Maryland. Copeia 1953(2):117-119.

In Chamber's Lake, *Esox niger* was found to be in association with *Acantharchus*.

Mansueti, R. and R. S. Scheltema 1953

Summary of fish collections made in the Chesapeake Bay area of Maryland and Virginia during October, 1953. Maryland Dep. Res. Educ., Chesapeake Biol. Lab., Field Summary no. 1, 18 p. (mimeo)

Appears in the checklist of fish phylogenetically arranged. Also collected from the Potomac River.

Manther, H. W. 1926

Some North American fish Trematodes. Illinois Biol. Monogr. 10:127-264.

Distomum tereticolle taken from *E. reticulatus*.

Meehan, W. E. 1913

Fish culture in ponds and other inland waters. New York. 287 p.

Meek, A. 1916

The migrations of fish. London, Edward Arnold. 427 p.

Short note on the habitat of the American pickerel *Esox reticulatus* which is said to be present in the Southeastern United States.

Meek, S. E. 1896

A list of fishes and mollusks collected in Arkansas and Indian territory in 1894, Bull. U.S. Fish. Comm. (1895) part 15:341-349.

Meek, S. E. and R. Newland 1886

A review of the species of the genus *Esox*. Proc. Acad. Natur. Sci. Philadelphia, (1885) part 3:367-375.

Lengthy synonymy of the species of the genus *Esox*. Key. Synonymy, origin of each description and notes on habitat for each species. *Esox reticulatus* may be *Esox niger*. List of nominal species with identifications arranged in chronological order includes *E. reticulatus*, *E. niger*, *E. tridecem-lineatus*, *E. vermiculatus*.

Melançon, C. 1968

Les poissons de nos eaux. 3rd ed. La Société Zoologique de Québec. 25 p.

Short description of the merits of the fish. (In French)

Menzel, B. W. and D. M. Green, Jr. 1972

A colour mutant of the chain pickerel, *Esox niger* LeSueur. Trans. Amer. Fish. Soc. 101(2):370-372.

Colour mutants collected from Dryden Lake. Gives description of mutants, why not hybrids, possible hybrid between normal and mutants and compares to *E. lucius* colour mutant.

Merrilees, M. J. 1972

Relationship between the lateral line sensory system and the cardioid scale pits in the family Esocidae (Salmoniformes). Univ. Toronto, Ph.D. diss., 195 p.

Details on sensory and nonsensory structures associated with notched scales of various esocids including *E. niger*.

Meyer, M. C. 1962

The larger animal parasites of the freshwater fishes of Maine. Maine Dep. Inland Fish. Game, Fish. Res. Manage. Div. Bull. no. 1, 88 p.

Meyers, C. D. and R. J. Muncy 1962

Summer food and growth of chain pickerel, *Esox niger*, in brackish waters of the Severn River, Maryland. Chesapeake Sci. 3(2):125-128.

Of 220 chain pickerel collected from the upper Severn River, all but eight were young-of-the-year. Invertebrates made up a major portion of the diet of pickerel less than 80 mm standard length, while fish comprised most of the diet of pickerel larger than 80 mm. Feeding occurred throughout the day and night.

Migdalski, E. C. 1962

Angler's guide to the fresh water sport fishes of North America. New York, The Ronald Press Co. 431 p.

Lengthy account discusses distribution, habitat, distinguishing features, size and growth, age, spawning, life history, hybrids, food, winter and summer angling, size limits, and attributes as a game fish. Identification charts. (p. 253-257, 403)

Miller, J. G. 1962

Occurrence of ripe chain pickerel in the fall. Trans. Amer. Fish. Soc. 91 (3): 323.

Of 101 chain pickerel, taken in Black Moshannon dam, 10 males and eight females were ripe. Eggs from two females were fertilized and hatched (68% hatching success). Ripe pickerel were taken from this dam on September 20-29, 1961 and March 17-31, 1961 both of which correspond closely to the fall and spring equinox.

Miller, J. 1970

Pennsylvania's record fish. Pennsylvania Angler, June:26-27.

Miller, L. F. 1945

A comparison of the hoop-net catches in several fish habitats of Wheeler Reservoir. Trans. Amer. Fish. Soc. (1943) 73:37-40.

Caught by hoop nets in Wheeler Reservoir 1941.

Ming, A. D. 1968

Life history of the grass pickerel, *Esox americanus vermiculatus* in Oklahoma. Oklahoma Fish. Res. Lab., Bull. no. 8, Contrib. no. 171, M.Sc. diss., 66 p.

Scale method of age determination is difficult.

Mitchill, S. L. 1814

The fishes of New York, described and arranged. Trans. Lit. Phil. Soc. New York (1814) 1:355-492.

The description that was given under the species name *Esox lucius* is more likely a description of *Esox niger*.

Mitchill, S. L. 1825

Esox tridecemlineatus. Mirror:361. (N.V.)

Montpetit, A. N. 1897

Les poissons d'eau douce du Canada. Montréal. C. O. Beauchemin et fils, Libraires—Imprimeurs. 553 p.

North American distribution (emphasis on Quebec) and common names. In French. Black and white drawing.

Montross, L. 1937

Palooka of the pond. Esquire, May:84. (N.V.)

Moody, H. L. 1957

A fishery study of Lake Panasoffkee, Florida. Quart. J. Fla. Acad. Sci. 20(1):21-88.

Collected from L. Panasoffkee. Table gives information on seine catches.

Moore, G. A. 1968

Fishes, p. 21-165. In W. F. Blair, A. P. Blair, P. Brodtkorb, F. R. Cagle, and G. A. Moore. Vertebrates of the United States. 2nd ed. New York. McGraw-Hill. 616 p.

Key. Mentions description and distribution. (p. 51, 52)

Morgan, A. H. 1930

Field book of ponds and streams. An introduction to the life of fresh water. New York and London, G. P. Putnam's Sons. 448 p.

Very brief mention of habitat, description, habits, size, distribution.

Morrison, G. R. 1957

The incidence and distribution of the bass tapeworm (*Proteocephalus ambloplitis*) in southern New Hampshire waters. New Hampshire Fish Game Dep., Tech. Circ. no. 13, 33 p.

Plerocercoid infections in *E. niger* investigated. Found to occur mainly in liver, fat and mesenteries and were generally light infections. Those infected were measured. Occurrence and degree of infection in southern New Hampshire listed in tables. Comparison of incidence and species infected also given in table.

Mueller, J. F. 1931

A new species of Cyclochaeta from the ureters and urinary bladder of *Esox reticulatus*. J. Parasitol. 18(2):126.

C. renicola found infesting the urinary bladders and ureters of *Esox reticulatus* in Oneida Lake, N.Y. This is the first member of the genus reported from an endoparasitic location and it appears to be specific for *E. reticulatus*.

Mueller, J. F. 1932

Trichodina renicola (Mueller, 1931), a ciliate parasite of the urinary tract of *Esox niger*. Roosevelt Wild Life Ann. 3(2):139-154.

Trichodina renicola appears to be specific for *E. niger*. Discusses capture records, pathology and transmission. Figures a cross section of *E. niger* ureter showing *Trichodina*.

Mueller, J. F. and H. J. Van Cleave 1932

Parasites of Oneida Lake fishes. Part 2. Descriptions of new species and some general taxonomic considerations, especially concerning the trematode family Heterophyidae. Roosevelt Wild Life Ann. 3(2):73-137.

E. niger is a host species for *Spinitectus gracilis* Ward and Magath. (p. 107)

Muir, R. 1967

It's through the ice for fresh pickerel. New Jersey Outdoors, January, 17:10-13.

Chain pickerel are New Jersey's most representative game fish. Ice fishing is very popular and effective for pickerel. Live golden shiners are one of the best baits.

Mullan, J. W. and R. S. McCaig 1960 a

Harvest studies on managed ponds. Central Massachusetts census. Comet, Chauncey, Bartlett, Little Chauncey, and Hampden Ponds. Onata Lake. Massachusetts Div. Fish. Game, D-J Proj. F-10-R-3, Job 1, 27 p.

Mullan, J. W. and R. S. McCaig 1960 b

Harvest studies on managed ponds. Southeastern Massachusetts census. Cliff Pond. Little Cliff Pond. Flax Pond. Higgins Pond. Norton Reservoir. Massachusetts Div. Fish. Game, D-J Rep. F-10-R-3, Job 2, 28 p.

Mullan, J. W. and R. S. McCaig 1960 c

Quabbin reservoir investigation. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-6, 11 p.

Mullan, J. W. and R. S. McCaig 1961 a

Harvest studies on managed ponds. Southeastern Massachusetts census. Cliff Pond. Little Cliff Pond. Flax Pond. Higgins Pond. Massachusetts Div. Fish. Game, D-J Proj. F-10-R-4, Job 2, 23 p.

Mullan, J. W. and R. S. McCaig 1961 b

Harvest studies on managed ponds. Central Massachusetts census. Comet Pond. Chauncey Pond. Little Chauncey Pond. Bartlett Pond. Massachusetts Div. Fish. Game, D-J Proj. F-10-R-4, Job 1, 20 p.

Mullan, J. W. and R. S. McCaig 1961 c

Quabbin reservoir investigations. Massachusetts Div. Fish. Game, D-J Proj. F-6-R-7, 12 p.

Mullan, J. W. and M. Miskewich 1962

Connecticut River survey. Population studies. Massachusetts Div. Fish. Game, D-J Proj. F-17-R-1, Job 1, 30 p.

Mullan, J. W. and L. C. Schlotterbeck 1960

Reclamation of the Deerfield River for trout and evaluation of this technique as applied. Before and after population studies. Massachusetts Div. Fish. Game, D-J Proj. F-14-R-1, Job 3, 12 p.

Murawski, W. S. 1959

Fish population dynamics. New Jersey Div. Fish Game, D-J- Proj. F-9-R-2, Job 7, 6 p.

Murawski, W. S. 1960 a

Introduction of native species into new environments. New Jersey Div. Fish Game, D-J Proj. F-9-R-3, Job 1, 10 p.

Murawski, W. S. 1960 b

Continued evaluation of previous population manipulation work. New Jersey Div. Fish Game, D-J Proj. F-9-R-3, Job 5, 7 p.

Murawski, W. S. 1960 c

Fish population dynamics. New Jersey Div. Fish Game, D-J- Proj. F-9-R-3, Job 7, 9 p.

Murawski, W. S. 1961 a

Fish population dynamics. New Jersey Div. Fish Game, D-J Proj. F-9-R-4, Job 7, 12 p.

Murawski, W. S. 1961 b

Introduction of native species into new environments. New Jersey Div. Fish Game, D-J Proj. F-9-R-4, Job 1, 7 p.

Musick, J. A. 1962

Fauna of New Jersey: chain-pickerel. New Jersey Outdoors, May, 12:3-9.

Chain pickerel, one of the most popular freshwater game fish, is distributed statewide. Nine years is about the maximum age for this species. Proper management of habitat is the best method of good pickerel production. Chain pickerel and largemouth bass compete with each other and when one is abundant the other will be relatively scarce. About 20,000 pickerel harvested annually by angling.

Nash, C. W. 1908

Check list of the fishes of Ontario. p. 7-122. In [Manual of] Vertebrates of Ontario. Ontario Dep. Educ., Toronto, L. K. Cameron. 229 p.

Erroneous records of this species in Ontario are often based on this publication which gives a description of the green pike, *Lucius reticulatus*.

Nash, C. W. 1913

Fishes. Chapt. 19, p. 249-271. In J. H. Faull. ed. The Natural History of the Toronto Region. Toronto, Canadian Inst. 419 p.

Erroneous report of *Lucius reticulatus* from Ontario.

Needham, J. G. 1920

Clean waters for New York State. Cornell Rural School Leaflet. 13(4):153-182.

Small drawing of *E. reticulatus* accompanies information on habitat, food, range, spawning, open season and size. (given on a child's level)

Needham, R. G. 1964

Fish population of Current River. Missouri Conserv. Comm., D-J Proj. F-1-R-13, Job 11, 21 p.

Nelson, G. J. 1972

Cephalic sensory canals, pitlines, and the classification of esocoid fishes, with notes on galaxiids and other teleosts. Amer. Mus. Novitates, no. 2492, 42 p.

Cephalic sensory canals and pitlines in *E. niger* and other esocoid fishes are described in detail. These are used to discuss phyletic trends and possible evolutionary history of these fishes.

Netsch, N. F. 1966

Warm water stream management. Buffalo River creel and gigging census. Tennessee Game Fish Comm., D-J Proj. F-17-R-10, wk. pl. 1, 30 p.

Newell, A. E. 1960

Biological survey of lakes and ponds in Coos, Grafton and Carroll Counties. New Hampshire Fish Game. Surv. Rep. no. 8a:23. (N.V.)

Nichols, H. M. 1954

Reelfoot Lake investigations. Sport fishery yield. Quart. Progr. Rep. Tennessee Game Fish Comm., D-J Proj. F-5-R-1, wk. pl. 2, Job A, QU4, p. 2-9.

Nichols, H. M. 1962

Reelfoot Lake investigations. Tennessee Game Fish Comm., D-J Proj. F-5-R-10, Fin., 57 p.

Nikol'skii, G. V. 1961

Special ichthyology. Israel Program Sci. Translations. 538 p.

List characteristics of the order (Esociformes) and discusses its origin and taxonomic position. Nomenclature of the genus *Esox* is given as well as notes on life history of species including *E. niger*.

Nowell, H. C. 1962

Trout stream investigations. Trout stream reclamation studies on the Big River Watershed. New Hampshire Fish Game Dep., D-J Proj. F-5-R-10, Job 1, 36 p.

Odell, T. T. 1932

Lakes of the Oswegatchie and Black River Systems. Sect. 3, p. 94-119. In A biological survey of the Oswegatchie and Black River Systems, including also the lesser tributary streams of the upper St. Lawrence River and of northeastern Lake Ontario. Suppl. 21st Annu. Rep., New York Conserv. Dep., Biol. Surv. (1931), no. 6, 344 p.

Table indicating relative abundance of the fish of some lakes in the area includes *E. niger*.

Odell, T. T. 1933

Lakes of the Upper Hudson Watershed. Sect. 3, p. 102-125. In A biological survey of the Upper Hudson watershed. Suppl. 22nd Annu. Rep., New York Conserv. Dep., Biol. Surv. (1932) no. 7, 341 p.

Mentioned in notes on those lakes where it is found. Number 42 in table showing relative abundance of fish in some lakes of the area.

Odell, T. T. and W. C. Senning 1938

Lakes and ponds of the Allegheny and Chemung watersheds. Sect. 3, p. 74-101. *In* A biological survey of the Allegheny and Chemung watersheds. New York Conserv. Dep., Suppl. 27th Annu. Rep., Biol. Surv. (1937) no. 12, 287 p.

The important lakes and ponds in the Allegheny and Chemung drainages were studied to determine factors affecting productivity and to formulate management policies. Table 1 shows abundance of fishes (including chain pickerel) in some lakes of the area.

Ommanney, F. D. 1969

The fishes. Rev. ed. New York, Time-Life books (Life Nature Library). 192 p.

One of the fishes depicted in large colour plate of freshwater species. (p. 19-21)

Orr, R. T. 1966

Vertebrate biology. 2nd ed. Philadelphia, W. B. Saunders Co. 483 p.

Palmer, E. L. and A. H. Wright 1920

A biological reconnaissance of the Okefinokee Swamp in Georgia: the fishes. Iowa Acad. Sci. 27:353-377. (N.V.)

Parsons, J. W. 1952

Creel census and population studies. Collection of creel census data. Quart. Progr. Rep., Tennessee Game Fish Comm., D-J Proj. F-2-R-1, wk. pl. 2, Job B, QU4, p. 2, p. 7-9.

Pate, V. S. L. 1933

Studies on fish food in selected areas. Sect. 4, p. 130-156. *In* A biological survey of the Upper Hudson watershed. Suppl. 22nd Annu. Rep., New York Conserv. Dep., Biol. Surv. (1932) no. 7, 341 p.

Food of chain pickerel included in summaries of fish food records, recorded in percentages, tables 7 and 8.

Pfeiffer, P. W. 1968

Fish population studies. Kentucky Dep. Fish Wildlife Resour., D-J Proj. F-30-R-1, wk. pl. 01, Job A, 12 p.

Pflieger, W. L. 1964

Fish population of Eleven Point River. Missouri Conserv. Comm., D-J Proj. F-1-R-13, wk. pl. 8, Job 4, 15 p.

Pflieger, W. L. 1966

A check-list of the fishes of Missouri, with keys for identification. Missouri Dep. Conserv. Div. Fish., D-J Ser. no. 3, 63 p. (under D-J proj. no. F-1-R) Key. (p. 30)

Pflieger, W. L. 1971

A distributional study of Missouri fishes. Univ. Kansas Pub., Mus. Natur. Hist. 20(3):225-570.

Note on chain pickerel includes short synonymy, distribution and habitat, zoogeography. Lists collection sites. Small North American distribution map.

Phillips, H. A. 1968

Fisheries investigations in lakes and streams—district four. Stream investigations. South Carolina Div. Game Boating, D-J Proj. F-11-R-3, Job 1, p. 4-23.

Phillips, J. 1960

Pickereel fishing. New Jersey Outdoors, May, 10:3-4.

May is an excellent pickerel fishing month. They are taken on a variety of lures and by flyrod, casting tackle, spinning outfit, and using a cane pole for skittering or with live minnows.

Pickens, A. L. 1928

Fishes of upper South Carolina. Copeia no. 167:29-32.

Esox reticulatus has general distribution in South Carolina.

Plummer, J. T. 1851

List of fishes found in the vicinity of Richmond, Indiana. Proc. Boston Soc. Natur. Hist. (1848-1851) 3:54-55.

Pratt, H. S. 1923

Preliminary report on the parasitic worms of Oneida Lake, New York. Roosevelt Wild Life Bull. 2(1):55-71.

Prime, W. C. 1876

Tenacity of life in pickerel. Forest Stream 7:154. (N.V.)

Prince, A. W. 1965

Pirate of the pads. Outdoor Life, August 136(2):48,49,66,67,92,93. (N.V.)

Prince, E. E. 1898

On the Esocidae (or Luciidae) of Canada. Rep. 67th Meet. British Ass. Advan. Sci. (1897):688.

Gives counts for *E. reticulatus* comparing it with other esocids.

Prosser, N. S. 1968

Warmwater fisheries management investigations. (General survey) Virginia Comm. Game Inland Fish., D-J Proj. F-10-R-17, Job 9, 19 p.

Chain pickerel are listed as one of the species providing most of the sport fishing in the tidal area as well as above the tidal limits in the Rappahannock River.

Putnam, F. W. 1861

No title. Extracts from the Proc. Boston Soc. Natur. Hist. (1859-1861) 7:3,156,159.

Discusses the distinction between *E. ornatus* and *E. fasciatus* (both = *E. americanus*) on one hand and *E. reticulatus* (= *E. niger*) on the other. Also discusses confusion in use of these names by contemporaries.

Pyle, A. B. 1963

Research in trout management. Acid water trout studies. New Jersey Div. Fish Game, D-J Proj. F-20-R-1, wk. pl. 2, Job 2, 26 p.

Radforth, I. 1944

Some considerations on the distribution of fishes in Ontario. R. Ont. Mus. Zool. Contrib. no. 25, 116 p.

Short note on range and distribution map showing collection sites.

Raney, E. C. 1942

The summer food and habits of the chain pickerel (*Esox niger*) of a small New York pond. J. Wildlife Manage. 6(1):58-66.

The most important food of 104 young pickerel collected during the summer was insects (64% of total volume). From 145 older pickerel (at least one year old) stomachs with food, fish occurred in 47.6% while crayfish occurred in 44.8%. Although young bullheads were less abundant than sunfish and yellow perch, they were eaten more often by older pickerel.

Raney, E. C. 1950

Freshwater fishes of the James River Basin Virginia Part 2, p. 151-194. *In* I. N. Gabrielson. The James River Basin, past, present and future. Virginia Acad. Sci., Richmond, Virginia. 843 p.

Short descriptive note on the chain pickerel includes collection records.

Raney, E. C. 1951

Freshwater fishes of New York. Farm Res. 17(4):1.

Said to be one of the important game fishes.

Raney, E. C. 1955

Natural hybrids between two species of pickerel (*Esox*) in Stearns Pond, Massachusetts. P. 405-420. *In* Supplement to Fisheries Report for some central, eastern, and western Massachusetts, lakes, ponds, and reservoirs, 1951-1952. Massachusetts Bur. Wildlife Res. Manage., Div. Fish. Game, 447 p.

Mentions natural hybrids of *Esox lucius* x *E. niger* and *E. niger* x *E. americanus*. Gives information on number, sex, S.L.; dorsal, anal, pelvic ray counts; total pectoral fins and branchiostegal ray counts; character index.

Raney, E. C. 1959

Some young fresh-water fishes of New York. New York Conserv. Dep., Div. Conserv. Educ., Inform. Leaflet, from New York State Conservationist:22-28.

Distribution, life history and description. Small colour figure.

Raney, E. C. and W. H. Massman 1953

The fishes of the tidewater section of the Pamunkey River, Virginia. J. Washington Acad. Sci. 43(12):424-432.

Annotated list, gives locations where *E. niger* found in the study.

Rathbun, R. and W. Wakeham 1897

Report of the joint commission relative to the preservation of the fishes in the waters contiguous to Canada and the United States. 54th Congress, 2nd Session, House Doc. no. 315:14-178. (N.V.)

Raver, D., Jr. 1962

Some North Carolina fresh-water fishes. North Carolina Wildlife Resour. Comm., 46 p.

Paragraph on each of description, distribution, life history, fishery importance. Colour illustration. (p. 19)

Reece, M. 1963

Fish and fishing. A Better Homes and Gardens Book. New York, Des Moines, Meredith Press. 224 p.

A short descriptive note on life history, size, sport fishing, food, spawning habits, accompanies a rough distribution map and drawings. Colour illustration.

Reed, J. R. 1969

Alarm substances and fright reaction in some fishes from the southeastern United States. Trans. Amer. Fish. Soc. 98(4):664-668.

A predator odour capable of eliciting a fright response in local prey species was found in *Esox niger*.

Reed, R. J. 1971

Underwater observations of the population density and behavior of pumpkinseed, *Lepomis gibbosus* (Linnaeus) in Cranberry Pond, Massachusetts. Trans. Amer. Fish. Soc. 100(2):350-353.

Esox niger was present during the study.

Reid, G. K., Jr. 1950

Notes on the centrarchid fish *Mesogonistius chaetodon elizabethae* in peninsular Florida. Copeia 1950(3):239-240.

Brief mention of habitat.

Richardson, L. R. 1935

The freshwater fishes of south-eastern Quebec. McGill Univ. Dep. Zool., Ph.D. diss., 196 p.

Key. Discussion includes synonymy, physical characteristics, distribution in southeastern Quebec.

Riel, A. D. 1967

Warm-water fisheries management investigations. Merrymeeting Lake perch control. New Hampshire Fish Game Dep., D-J Proj. F-11-R-6, wk. pl. 2, Job 1. 3 p.

Rosebery, D. A. 1952

Game fish survey of the impounded public fishing waters. Fish survey of Back Bay. Virginia Comm. Game Inland Fish., D-J Proj. F-1-R-1, SP, 30 p.

Ross, R. D. 1959 a

Game fish streams and records of fishes from the Potomac-Shenandoah River system of Virginia. Virginia Agr. Exp. Sta., Virginia Polytechnic Inst., Tech. Bull. no. 140, 20 p.

E. niger was collected from Black Creek (Potomac drainage), 0.7 miles (1.1 km) north of Gainesboro, Frederick County.

Ross, R. D. 1959 b

A key to the fishes of the Shenandoah River system in Virginia. Virginia Agr. Exp. Sta., Virginia Polytechnic Inst., Tech. Bull. 142, 14 p.

Lists the chain pickerel as occurring in the Shenandoah River system in Virginia.

Ross, R. D. and G. E. Lewis 1971

Stream survey of District II, West Virginia. D-J Proj. F-10-R (1-2), 49 p.

Lists streams of four drainages and their physical and chemical characteristics, fish populations, pollution and other data. Chain pickerel are found only in the Potomac River drainage.

Rostlund, E. 1952

Freshwater fish and fishing in native North America. Berkeley and Los Angeles, Univ. California Press, Univ. California Publ. Geogr., vol. 9, 313 p.

Distribution map B shows the distribution of *E. niger*. (p. 276, 277)

Roy, J. M. and G. Beaulieu 1965

Guide de l'Aquarium. Québec, Ministère de l'Industrie et du Commerce, Direction des Pêcheries. 79 p.

Paragraph note written in French gives maximum length and weight, habitat, and distribution. (p. 27)

Ruhr, C. E. 1954

Statewide survey and evaluation of streams. Fish population study in streams. Quart. Progr. Rep. Tennessee Game Fish Comm., D-J Proj. F-3-R-3, wk. pl. 2, Job B, QU3, p. 2-4, 8.

Ruhr, C. E. 1958

Warm water stream management. Tennessee Game Fish Comm., D-J Proj. F-17-R-3, 15 p.

Ruhr, C. E. 1959

Warm water stream management. Tennessee Game Fish Comm., D-J Proj. F-17-R-4, 25 p.

Ruhr, C. E. 1960

Laurell Hill Lake construction. Tennessee Game Fish Comm., D-J Proj. F-16-D-1, 25 p.

Ruhr, C. E. 1961

Warm water stream management. Tennessee Game Fish Comm., D-J Proj. F-17-R-2, 25 p.

Ruhr, C. E. 1962

Warm water stream management. Tennessee Game Fish Comm., D-J Proj. F-17-R-5, 20 p.

Rupp, R. S. and S. E. De Roche 1965

Standing crops of fishes in three small lakes compared with C14 estimates of net primary productivity. Trans. Amer. Fish. Soc. 94(1):9-25.

E. niger was present in Shagg Lake and Coleback Lake, Maine, before rotenone treatment. Numbers, weight and total lengths were estimated.

Russell, T. R. 1965

Fish population of the Eleven Point River. Missouri Conserv. Comm., D-J Proj. F-1-R-14, wk. pl. 8, Job 4, 10 p.

Russell, T. R. 1966

Fish population of Current River. Missouri Conserv. Comm., D-J Proj. F-1-R-15, wk. pl. 9, Job 2, 16 p.

Russell, T. R. 1967

Fish population of Current River. Missouri Conserv. Comm., D-J Proj. F-1-R-16, wk. pl. 9, Job 2, 17 p.

Ryder, J. A. 1887

On the development of osseous fishes, including marine and freshwater forms. U.S. Fish. Comm. Rep. (1885) Part 13:488-604.

Embryological development of *Esox reticulatus* LeSueur, based on two specimens of 9 mm and 11.5 mm in length.

Saila, S. B. 1956

Estimates of the minimum size-limit for maximum yield and production of chain pickerel, *Esox niger* (LeSueur), in Rhode Island. Limnol. Oceanogr. 1(3):195-201.

Mortality rates were deduced from weighted geometric means of age frequencies in an unexploited and an exploited population. Calculated growth and weight was determined for 257 pickerel from 32 ponds. A minimum size limit of 12 inches (305 mm) was found to be best.

Saila, S. B. and D. Horton 1957

Fisheries investigations and management in Rhode Island lakes and ponds. Rhode Island Dep. Agr. Conserv., Fish. Publ. no. 3, 134 p.

Data on distribution, natural history, winter angling, sex ratios, age and growth, size and creel limits, other restrictions, stocking and recommendations and suggestions.

Sammuels, E. A. 1902

Random notes of an angler. Forest Stream 59(8):146.

Primarily of interest to the angler.

Sanderson, A. E., Jr. 1950

An ecological survey of the fishes of the Severn River with reference to the eastern chain pickerel, *Esox niger* (LeSueur), and the yellow perch, *Perca flavescens* (Mitchell). Univ. Maryland, M.S. diss., 47 p.

Chain pickerel are widely distributed in the Severn River. Food of the pickerel varied seasonally, depending on what fish were the most abundant. Length-weight data is presented on 79 adult pickerel. The 35 males with four annuli reached a length of 22.1 inches (561 mm) and 44 females with four annuli reached a length of 24.7 inches (627 mm).

Sanderson, A. E., Jr. 1959

Esox—the forgotten fish. Maryland Conservationist (1959) 36(1):14-16.

Presents results of a survey of the tidal Severn River, Maryland (1949-1950), including data on length, weight, age, growth rate, food habits, and analysis of stomach contents.

Sanderson, A. E. 1960

Maryland statewide inland fisheries investigation. Estimates of rates of exploitation of crappie. Maryland Dep. Game Inland Fish, D-J Proj. F-10-R-3, Job 5, 5 p.

Schreitmüller, W. 1915

Neue Fische im "Zoo" zu Frankfurt a. M. Blätt. Aquar. Terrar. Kunde. 26:130-131.

Lists the chain pickerel as new to the Frankfurt Zoo for display.

Schrenkeisen, R. M. 1963

Field book of fresh-water fishes of North America north of Mexico. New York, G. P. Putnam's Sons. 312 p.

Schwartz, F. J. 1960

The pickerels. Maryland Conservationist 37(4):23-26.

Pickerel introduced into Maryland 1930-31, and in 1956 into Deep Creek Lane, Garrett County. Gives key to identify esocids of Maryland. Notes on description of young, spawning, behaviour, distribution.

Schwartz, F. J. 1964

Natural salinity tolerances of some freshwater fishes. Underwater Natur. 2(2):13-15.

Records *E. niger* as common at salinity of 22.0 p.p.t.

Schwartz, F. J. 1972

World literature to fish hybrids with an analysis by family, species, and hybrid. Publ. Gulf Coast Res. Lab. Mus. 3, 328 p.

A bibliography of fish hybrids including those of *Esox niger*.

Scott, W. B. 1958

A checklist of the freshwater fishes of Canada and Alaska. R. Ont. Mus., Div. Zool. Palaeon., 30 p.

Esox niger listed.

Scott, W. B. 1967

Freshwater fishes of eastern Canada. 2nd ed. Univ. Toronto Press. 137 p.

Notes on other common names, distinguishing features, size, occurrence, life history, habits, food.

Scott, W. B. and E. J. Crossman 1959

The freshwater fishes of New Brunswick: a checklist with distributional notes. R. Ont. Mus., Div. Zool. Paleontology, Contrib. no. 51, 37 p.

Introduction in New Brunswick and distribution.

Scott, W. B. and E. J. Crossman 1967

Provisional checklist of Canadian freshwater fishes. R. Ont. Mus., Information Leaflet, Dep. Ichthyology Herpetology, 24 p.

Present in the Atlantic watershed basin.

Scott, W. B. and E. J. Crossman 1969

Checklist of Canadian freshwater fishes with keys for identification. R. Ont. Mus., Life Sci. Misc. Publ., 104 p.

Distribution and key.

Seaman, E. A. and E. W. Surber 1949

The catches of fish in two smallmouth bass streams in West Virginia. West Virginia Conserv. Comm., Tech. Bull. no. 1, 37 p.

In this study, eight pickerel were reported caught by angling in the South Branch River near Romney and nine pickerel were reported caught from the Cacapon River.

Seamans, R. G. 1960

Problem lakes and ponds studies. Newfound Lake, Hebron-Groton-Bristol, New Hampshire. New Hampshire Fish Game Dep., D-J Proj. F-9-R-4, Job 1, 52 p.

Senton, A. H. and M. M. Stewart 1971

Keys to the vertebrates of the northeastern states (excluding birds). 3rd ed. New, Faculty-Student Ass., New York State Univ. at Albany. 52 p.

Esox niger listed as a fish of northeastern United States. Key to families.

Sexton, A. D. 1963

Investigations of the antigenic relationships of the Esocidae and two species of Percidae. Pennsylvania Univ. Ph.D. diss., 55 p.

A serological comparison of chain pickerel, northern pike, muskellunge, redbfin pickerel, grass pickerel, walleye and yellow perch to determine taxonomic relationships.

Sheridan, J. R. 1961

Pond draining and population manipulation. Virginia Comm. Game Inland Fish., D-J Proj. F-5-R-7, Job 2, 56 p.

Chain pickerel were present as predators in addition to largemouth bass in ponds ranging from 0.75 to 77.0 acres (0.30 to 31.2 hee) which were selected for draining.

Sheridan, J. R. 1962 a

Copper sulfate toxicity study. Virginia Comm. Game Inland Fish., D-J Proj. F-5-R-8, Job 7, 10 p.

E. niger made up 3.2%, by weight, of the total pounds of fish collected from Powhatan Lake (3.4 acres) (1.4 hec) after an application of copper sulfate at the rate of 2.1 ppm.

Sheridan, J. R. 1962 b

Warmwater fisheries management investigations. (General survey) Virginia Comm. Game Inland Fish., D-J Proj. F-5-R-8, Job 7, 10 p.

The Mattaponi River is said to provide good chain pickerel fishing. Several ponds at Camp A.P. Hill and Coleman's Lake also provide pickerel fishing.

Sheridan, J. R. 1963

Copper sulfate toxicity study. Virginia Comm. Game Inland Fish. D-J Proj. F-5-R-9, Job 7, 8 p.

Lists *E. niger* as making up 1.41% and 0.95%, by weight, of the total weight collected by copper sulfate treatment, in Brunswick County Pond (150 acres) (60 hec) and Rainey's Mill Pond (20 acres) (8 hec), respectively.

Shiner, D. 1963

Pickrel in Pennsylvania. Pennsylvania Angler 32(9):8-9.

Note on angling for pickerel in Lake Jean. Picture of fishermen with catch of chain pickerel.

Shoemaker, H. H. 1947

Pickrel and pumpkinseed coaction over the sunfish nest. Copeia 1947(3): 195-196.

Pickrel shared the nest of pumpkinseeds *Lepomis gibbosus* and appeared to drive away or seize golden shiners which were preying upon the sunfish eggs. Only once did the male sunfish attempt to drive the pickrel away.

Shoemaker, M. E. 1945

Fresh water fishing: a fisherman's manual. Garden City, New York, Doubleday, Doran and Co. 218 p.

Sindermann, C. J. 1953

Parasites of fishes of north central Massachusetts. Fisheries report for lakes of north central Massachusetts. Massachusetts Div. Fish. Game, Bur. Wildlife Res. Manage., 28 p.

Siolgitis, J. A. 1967

Pond surveys. Rhode Is. Div. Fish Game, D-J Proj. F-20-R-8, Job 11, 8 p.

Slastenenko, E. P. 1957

A list of natural fish hybrids of the world. Hidrobiologi ser. B, 4(2-3):76-97.

Slastenenko, E. P. 1958

The freshwater fishes of Canada. Toronto, Kiev Printers. 388 p.

Two-page account on the chain pickerel gives synonymy, detailed taxonomic description, size, distribution, habitat and habits, spawning, food, and mentions one hybrid. Also found in key, p. 140. (p. 145-146)

Smith, C. L. 1962

Some Pliocene fishes from Kansas, Oklahoma and Nebraska. *Copeia* 1962(3):505-520.

Fossil distribution. (p. 509)

Smith, F. R. 1953

A general discussion of lakes surveyed during the 1951 fisheries survey. New Jersey Fish Surv. Rep. no. 2, 142 p.

Smith, H. M. 1893 a

Report on a collection of fishes from the Albermarle region of North Carolina. Bull. U.S. Fish Comm. (1891) 11:185-200.

Lists presence of *E. niger*.

Smith, H. M. 1893 b

Report on fisheries of the South Atlantic States. Bull. U.S. Fish Comm. (1891) 11:271-356.

Lists presence of *E. niger*.

Smith, H. M. 1907

The fishes of North Carolina. North Carolina Geol. Econ. Surv. vol. 2. 453 p.

Notes on *E. reticulatus* under the following headings; common names, synonymy, diagnosis, distribution, size, food, habitat, and as a food fish.

Smith, H. M. and B. A. Bean 1899

List of fishes known to inhabit the water of the District of Columbia and vicinity. Bull. U.S. Fish Comm. (1898) 18:179-187.

Mentions presence of *E. niger*.

Smith, M. W. 1939

The fish population of Lake Jesse, Nova Scotia. Proc. Nova Scotian Inst. Sci. 19(1-4):389-427.

In a discussion of the effect of preservation of fish upon body length and weight, chain pickerel increased less in weight than pereiform species and showed individual changes from a loss of 0.04 to a gain of 0.6%.

Smith, M. W. 1941

Treatment of Potter's Lake, New Brunswick with rotenone. Trans. Amer. Fish. Soc. (1940) 70:347-355.

Esox niger killed by rotenone in Potter's Lake.

Smith, O. W. 1922

The book of the pike. Cincinnati, Stewart Kidd Co. 197 p.

Gives range of the eastern pickerel, *Esox reticulatus* and some characters for identification. Chapter on pickerel treats *E. reticulatus*, *E. americanus*, *E. vermiculatus*, as one species, and discusses habitat, spawning, feeding, and angling. Appendix: discussion of possibility of hybrids between great pike and pickerel.

Smith, R. F. 1953

Lakes and ponds. New Jersey Dep. Conserv. Econ. Development, Div. Fish Game, Fish. Surv. Rep. no. 2. 142 p.

Smith, R. F. 1955

Pickerel ice census on important New Jersey lakes. Evaluation of the fifteen-inch minimum size limit on pickerel in three New Jersey lakes. New Jersey Div. Fish Game, D-J Proj. F-6-R-1, 36 p.

Smith, R. F. and R. W. Gross 1955

An evaluation of the fifteen-inch minimum size limit on pickerel in three New Jersey lakes. New Jersey Fish. Lab., Misc. Rep. no. 15, 20 p. (mimeo.)

A 15 inch minimum size limit did not appear to make more or larger pickerel available. An increase in ice harvest on Lake Hopatcong may be attributed to an increase in fishing effort rather than to the minimum size limit. Sublegal pickerel are extremely vulnerable to all types of angling gear. Ice fishing accounts for a large portion of the pickerel harvest.

Smith-Vaniz, W. F. 1968

Freshwater fishes of Alabama. Auburn, Alabama, Auburn Univ. 211 p.

Key and short synonymy (p. 25).

Sorenson, L., K. Buss and A. D. Bradford 1966

The artificial propagation of esocid fishes in Pennsylvania. Progr. Fish-Cult. 28(3):133-141.

Speirs, J. M. 1957

Preliminary bibliography on *Esox niger*. Univ. of Toronto, manuscript, 4 p.

Lists 25 references on *E. niger*.

Starks, E. C. 1904

A synopsis of characters of some fishes belonging to the order Haplomi. Biol. Bull. Marine Biol. Lab., Woods Hole, Massachusetts, 7(5):254-262.

Detailed osteological characters of *E. reticulatus*, as representative of the family Esocidae.

Starks, E. C. 1916

The sesamoid articular, a bone in the mandible of fishes. Leland Stanford Junior Univ. Publ., Univ. Ser., 40 p.

A detailed general discussion of this bone in various groups of fishes. That of the chain pickerel was used to exemplify the condition in the family Esocidae.

Starks, E. C. 1930

The primary shoulder girdle of the bony fishes. Stanford Univ. Publ., Univ. Ser., Biol. Sci., 6(2):147-239 (1-93).

Technical discussion of the structure of the primary shoulder girdle of *E. reticulatus* including comparison with *Esox lucius* and *Esox vermiculatus*.

Stevens, R. E. 1964

Investigation of fish populations in lakes Moultrie, Marion, Catawba and Wateree. Netting and seining. South Carolina Div. Game Boating, D-J Proj. F-1-R-12, Job 3, p. 17-24, 38-73.

Stewart, R. W. 1963

Fish population dynamics. New Jersey Div. Fish Game, D-J Rep. F-9-R-6, Job 7, 6 p.

Stewart, R. W. 1967 a

Division of a management program for Shannock Pond no. three. New Jersey Div. Fish Game, D-J Proj. F-23-R-2, wk. pl. 1, Job 2, 10 p.

Stewart, R. W. 1967 b

Development of a management program for Prospertown Lake. New Jersey Div. Fish Game, D-J Proj. F-23-R-2, wk. pl. 1, Job 8, 9 p.

Stewart, R. W. 1968 a

Division of a management program for Shannoc Pond no. three. New Jersey Div. Fish and Game, D-J Proj. F-23-R-3, wk. pl. 1, Job 2, 8 p.

Stewart, R. W. 1968 b

Division of a management program for Spruce Run Res. New Jersey Div. Fish Game, D-J Proj. F-23-R-3, wk. pl. 1, Job 6, 34 p.

Stewart, R. W. 1968 c

Division of a management program for Prospertown Lake. New Jersey Div. Fish Game, D-J Proj. F-23-R-3, wk. pl. 1, Job 8, 7 p.

Stewart, R. W. 1968 d

Division of a management program for Stafford Forge and Impound. New Jersey Div. Fish Game, D-J Proj. F-23-R-3, wk. pl. 1, Job 10, 12 p.

Storer, D. H. 1839

A report on the fishes of Massachusetts. Boston J. Natur. Hist. (1838-1839) 2:289-570.

Description of *E. reticulatus* LeSueur.

Storer, D. H. 1844

Three species of fishes. Proc. Boston Soc. Natur. Hist. 1:84.

Storer, D. H. 1846

A synopsis of the fishes of North America. Mem. Amer. Acad. Arts Sci. 2:253-550.

Description and synonymy of *E. reticulatus* LeSueur and *E. niger* LeSueur. (p. 437)

Storer, D. H. 1858

A history of the fishes of Massachusetts. Boston, Mem. Amer. Acad. Arts Sci. 6(2):309-372.

Description and synonymy of *Esox reticulatus* and also remarks on distribution, size and marketing. See *Ibid* vols. 5(1855), 8(1864), 9(1867), same title. These may have the same or added information.

Stroud, R. H. 1953 a

Notes on reliability of some fish tags used in Massachusetts. J. Wildlife Manage. 17(3):268-275.

A study was undertaken to determine the effectiveness of the use of both cheek tags and jaw tags on several species of fish, including the chain pickerel.

Stroud, R. H. 1953 b

Spot poisoning applied to the Massachusetts lake and pond fisheries survey. Progr. Fish-Cult. 15(1):3-10.

Collected by rotenone spot poisoning. Results treated in tables.

Stroud, R. H. 1955 a

Fisheries report for some central, eastern, and western Massachusetts lakes, ponds, and reservoirs, 1951-1952. Massachusetts Div. Fish. Game, Bur. Wildlife Res. Manage. 447 p.

Data on growth, food, habitat and distribution. Tables give information on age, weight and length.

Stroud, R. H. 1955 b

Manual for reconnaissance biological survey of Massachusetts lakes, ponds, and reservoirs. P. 421-447. In Supplement to fisheries report for some cen-

tral, eastern, western Massachusetts lakes, ponds, and reservoirs, 1951-1952. Massachusetts Bur. Wildlife Res. Manage., 447 p.

Discusses methods of analysis both chemical and physical, scale sampling and environmental requirements.

Stroud, R. H. 1970

SFI bulletin. Sport Fish. Inst. Bull. 214:8.

A 1969 legislative change made it legal, once again, to shoot and spear northern pike, pickerel, eelp, garfish, bowfin, mullet, shad, suckers and bullheads in Lake Champlain from March 25 through May 25. The use of a light when spearing was also legalized.

Stroud, R. H. and H. Bitzer 1955

Harvests and management of warmwater fish population in Massachusetts' lakes, ponds and reservoirs. Progr. Fish-Cult. 17(2):51-63.

Stubbs, J. M. 1963

Warm water stream management. A survey of smallmouth bass and rock bass reproduction on Duck River and Buffalo River. Tennessee Game Fish Comm., D-J Proj. F-17-R-10, wk. pl. 2, Job C, Sum., 9 p.

Stubbs, J. M. 1966

Warm water stream management. Marking and planting study and creel census, Duck River. Tennessee Game Fish Comm., D-J Proj. F-17-R-6, wk. pl. 2, Job A, Sum and Job B, Sum., 19 p.

Stubbs, J. M. and N. F. Netsch 1966

Warm water stream management. Marking and planting study and creel census, Duck River. Tennessee Game Fish Comm., D-J Proj. F-17-R-6, wk. pl. 2, Job A, Sum. Tenn. F-17-R-6, wk. pl. 2, Job B, Sum., 19 p.

Sullivan, C. R. 1955

Population manipulation studies on West Virginia smallmouth bass streams. Studies of other smallmouth bass streams. West Virginia Div. Game Fish, D-J Proj. F-1-R-5, Job F, 14 p.

Sullivan, C. R. 1956

Studies of other smallmouth bass streams. Conserv. Comm. West Virginia, D-J Proj. F-1-R-5, wk. pl. 1, Job F, 9 p.

In this survey of smallmouth bass streams, pickerel were found in five of 15 streams, with Tilhance Creek having the largest poundage, an estimated 10 pounds per acre (11.2 kg/hect) of pool.

Surber, E. W. and D. D. Friddle 1949

Relative toxicity of suspension and oil formations of DDT to native fishes in Black Creek, West Virginia. Trans. Amer. Fish. Soc. (1946) 76:315-321.

No adult *E. niger*, although common in this section, were found dead.

Swingle, H. S. 1954

Fish populations in Alabama rivers and impoundments. Trans. Amer. Fish. Soc. (1953) 83:47-57.

Minimum harvestable sizes of fishes used in computing AT values, tables.

Swingle, W. E. 1965

Length-weight relationships of Alabama fishes. Auburn Univ. Agr. Exp. Sta. Zool.-Entomol. Ser. Fish. 3, 87 p.

Tarzwel, C. M. 1942

Fish populations in the backwaters of Wheeler Reservoir and suggestions for their management. Trans. Amer. Fish. Soc. (1941) 71:201-214.

Tables. Weight per acre and relative abundance in Wheeler Reservoir. (p. 203-206)

Tarzwel, C. M. 1945

The possibilities of a commercial fishery in the TVA impoundments and its value in solving the short and rough fish problems. Trans. Amer. Fish. Soc. (1943) 73:137-157.

E. niger crassus caught with fyke net and seines in Middle Wheeler Reservoir. Table.

Tarzwel, C. M. 1959

Some effects of mosquito larviciding and the new pesticides on fishes. Proc. Symp. Coordination Mosquito Control Wildlife Manage., Washington, D.C., April 1-2, p. 84-93. (N.V.)

Thoits, C. F. and D. H. Buck 1966

Life history and growth of the chain pickerel in Illinois. Illinois Dep. Conserv., D-J Proj. F-16-R-4, 3 p.

Thompson, Z. 1842

History of Vermont, natural, civil and statistical in three parts with a new map of the state and 200 engravings. Burlington, C. Goodrich.

Description of *E. reticulatus*.

Thompson, Z. 1853

History of Vermont, natural, civil and statistical, in three parts, with an appendix. Burlington, C. Goodrich.

Detailed descriptions of physical characteristics and distribution in Vermont.

Thoreau, H. D. 1859

Esox from Concord. Proc. Boston Soc. Natur. Hist. 6:430.

Thorpe, L. M. 1942

Fishery management. Sect. 1, p. 21-68. In A fishery survey of important Connecticut lakes. Connecticut Geol. Natur. Hist. Surv., Pub. Doc. no. 47, Bull. 63, 339 p.

Appears in food chain figure. Mentioned throughout the report with respect to origins, distinction from grass pickerel, time of spawning, management of stunted species, use of anchored brush piles, ice fishing, average growth curves, frequency of age groups found in anglers' catches, size caught, legal length.

Todd, F. 1877

Pickerel in salt water. Field Stream 8(20):320.

Chain pickerel were noticed 6-8 miles (9.7-12.9 km) below the head of the tidal waters, 15 years after they were put into the St. Croix lakes.

Tomkiel, V. K. 1952

Studies on the feeding habits of the chain pickerel *Esox niger* (LeSueur) and the yellow perch, *Perca flavescens* (Mitchill), in some New Jersey lakes. Rutgers Univ., M.Sc. diss., 72 p.

In a study of four lakes, significant differences in the relative abundance of food types in pickerel stomachs correlated with the differences between

lake types from which the pickerel were obtained; and differences in relative abundance of food types found in pickerel between lakes correlated with the differences in growth rates of pickerel between lakes.

Tomlin, W. D. 1892

The pickerel. P. 387-396. In American game fishes. Chicago and New York, Rand, McNally and Co. 580 p.

Primarily an account of the pleasures and pains of angling for pickerel.

Tompkins, B. 1956

Fishing in the drink at Quabbin Reservoir. Massachusetts Div. Fish Game, Massachusetts Wildlife:2-5.

Giant pickerel were frequently taken during the early years of the Quabbin Reservoir (see plate p. 3). Physieal and chemical eharacteristics that changed during the filling of the reservoir were detrimental to many species. The pickerel became redued in numbers, although still of a large size.

Tompkins, W. A. 1953

Kentucky lake investigations. Netting operations. Kentucky Dep. Fish Wild-life Resour., D-J Proj. F-2-R-2, wk. pl. 1, Job B, QU1, 4 p.

Tompkins, W. A. 1958

A compendium of the life history and eeology of the chain pickerel *Esox niger* (LeSueur). Massachusetts Div. Fish. Game, Fish. Bull. no. 22, 3 p.

Toner, G. C. 1937

Preliminary studies of the fishes of Eastern Ontario. Suppl. 2, Bull. Eastern Ontario Fish Game Protective Ass., 24 p.

Erroneous reports of this species in Canadian waters of Lake Ontario often based on this publication.

Toner, G. C. 1943

Ecological and geographical distribution of fishes in eastern Ontario. Univ. Toronto, M.A. diss., 91 p.

In annotated list and reported from Lake Ontario, and Black River, N.Y.

Toole, J. E. 1964

Fisheries evaluation of commercial moss harvesting on Caddo Lake. Texas Parks Wildlife Dep., D-J Proj. F-3-R-11, wk. pl. B, Job 21, 6 p.

Towne, R. E. 1959

Ecological study of the Squam Lakes. Fisheries investigations at the Squam Lakes, New Hampshire. New Hampshire Fish Game Dep., D-J Proj. F-6-R-6, 290 p.

Tracy, H. C. 1910

Annotated list of fishes known to inhabit the waters of Rhode Island. Rhode Island Comm. Inland Fish., 40th Annu. Rep.:35-176.

Trautman, M. B. 1957

The fishes of Ohio with illustrated keys. Ohio State Univ. Press. 683 p.

Contains taxonomie eharacters and distribution and habitat of the chain pickerel in Ohio.

Trautman, M. B. and C. L. Hubbs 1935

When do pike shed their teeth? Trans. Amer. Fish. Soc. 65:261-266.

The teeth of 6 chain pickerel were examined and information tabulated.

Trippensee, R. E. 1953

Wildlife management. New York, McGraw Hill Book Co., Inc., vol. 2. 572 p.

Various life history data collected from a number of sources is presented.

Truitt, R. V., B. A. Bean and H. W. Fowler 1929

The fishes of Maryland. Maryland Conserv. Dep. Bull. no. 3, 120 p. (N.V.)

Turner, W. L. 1967

Reservoir sport fishery investigations. Creel survey. Tennessee Game Fish Comm., D-J Proj. F-31-R-1, Job 1, 23 p.

Underhill, A. H. (no date)

Skittering? New Jersey Outdoors, Dep. Conserv. Econ. Dev., Reprint, 3 p. (N.V.)

Underhill, A. H. 1939

Cross between *Esox niger* and *E. lucius*. Copeia 1939(4):237.

Artificial hybrids of a female chain pickerel and male northern pike were produced. These hybrids exhibited intermediate characteristics.

Underhill, A. H. 1948

Studies on the life history of the chain pickerel, *Esox niger* LeSueur. Cornell Univ., Ph.D. diss., 177 p.

An extensive review of the taxonomy, distribution, literature, spawning, hatching and development of young, age and growth, maturity, maturity and legal size, length-weight relationship, food, angling and economic importance of the chain pickerel.

Underhill, A. H. 1949

Studies on the development, growth and maturity of the chain pickerel, *Esox niger* (LeSueur). J. Wildlife Manage. 13(4):377-391.

Principal study areas were a pond, a lake and a stream. Pickerel eggs required 6-12 days to hatch. Fry commenced feeding at 10.2 mm and growth of young was rapid but varied from season and within bodies of water. Females grow faster than males. Oldest fish examined were seven years old. In the stream and lake, most two year old fish were sexually mature while in the pond, fish matured at three and four years of age. In these situations a 12 inch (305 mm) size limit was too small.

Van Cleave, H. J. 1923

Acanthocephala from the fishes of Oneida Lake, New York. Roosevelt Wild Life Bull. 2(1):73-84.

E. reticulatus is host for two of the species of Acanthocephala encountered in the collections from Oneida Lake.

Van Cleave, H. J. and J. F. Mueller 1932

Parasites of Oneida Lake fishes. Part 1. Descriptions of new genera and new species. Roosevelt Wild Life Ann. 3(1):1-72.

E. niger host species for *Macroderoides flavus*, which parasitizes the intestine and rectum, and is also host to *Hedruvis tiara*.

Van Cleave, H. J. and J. F. Mueller 1934

Parasites of Oneida Lake fishes. Part 3. A biological and ecological survey of the worm parasites. Roosevelt Wild Life Ann. 3(3):155-334.

A descriptive listing of parasite species utilizing *E. niger* as a host.

Van Oosten, J. 1946

The pikes. U.S. Fish Wildlife Serv., Fish. Leaflet no. 166, 6 p. (Revised by Van Oosten 1960, Fishery Leaflet no. 496.)

Van Oosten, J. 1960

The true pikes. U.S. Fish Wildlife Serv., Fish. Leaflet no. 496, 9 p.

General notes on description, range, habitat, feeding, spawning and age-growth data.

Wadman, R. D. 1960

Creel census on three reclaimed trout ponds. Connecticut Board Fish. Game, D-J Proj. F-20-R-2, Job 3, 46 p.

Wadman, R. D. 1961

Fishery investigations. Pond surveys. Rhode Island Div. Fish Game, D-J Proj. F-20-R-2, Job 11, 6 p.

Wagner, C. 1880

What does a fish cost? U.S. Fish Comm. Rep. (1878) 6:605-607.

Wagner, C. C. and E. L. Cooper 1963

Population density, growth, and fecundity of the creek chubsucker *Erimyzon oblongus*. Copeia 1963(2):350-357.

Young *Erimyzon oblongus* are thought to be valuable forage for *Esox niger*. Large numbers of chain pickerel were taken.

Walden, H. T. II 1964

Familiar freshwater fishes of America. 1st ed. New York, Harper and Row Publ. 324 p.

The chain pickerel has various names. Along with the chain pattern, the dark vertical bar below the eye is distinctive. Rarely exceeds three pounds. Clear, quiet, weedy waters of streams, ponds, and lakes preferred. Rarely lives beyond six years. Very voracious with diet of older pickerel being mainly fish.

Walke, E. H. 1883

Spawning of *Esox* (pike or pickerel) in North Carolina. U.S. Fish Comm. Bull. no. 3:295.

Ward, H. B. 1910

Internal parasites of the Sebago salmon. U.S. Bur. Fish Bull. (1908) 28(2): 1151-1194.

Ward, H. B. 1912

The distribution and frequency of animal parasites and parasitic disease in North American freshwater fish. Trans. Amer. Fish. Soc. (1911) 41:207-244.

Tables give number of fish infected and total infection of trematodes, cestodes, nematodes, acanthocephala, for *E. reticulatus*.

Ward, H. B. 1919

Stream pollution in New York State. Albany, N.Y. Conserv. Comm., 78 p.

Warner, K. 1972

Further studies of fish predation on salmon stocked in Maine lakes. Progr. Fish-Cult. 34(4):217-221.

Presents results of a study of predation, by various fishes including chain pickerel, on newly stocked salmon.

Warner, K. 1973

Spring food of chain pickerel (*Esox niger*) in Maine Lakes. Trans. Amer. Fish Soc. 102(1):149-151.

Warner, K., R. P. Auclair, S. E. De Roche, K. A. Harvey and C. F. Ritzi 1968
Fish predation on newly stocked landlocked salmon. J. Wildlife Manage. 32(4):712-717.

Chain pickerel were found to be the most common predators of stocked landlocked salmon.

Webster, D. A. 1942 a

Fishery management. Sect. 1, p. 21-68. In A fishery survey of important Connecticut lakes. Pub. Doc. 47, Connecticut Geol. Natur. Hist. Surv., Bull. no. 63, 339 p.

Webster, D. A. 1942 b

The life histories of some Connecticut fishes. Sect. 3, p. 122-227. In A fishery survey of important Connecticut lakes. Pub. Doc. no. 47, Connecticut Geol. Natur. Hist. Surv., Bull. no. 63, 339 p.

Present in Connecticut lakes, usually occupying the littoral area of deep lakes. Notes on distribution, reproduction and spawning, habits and habitat, feeding habits, results of food examination of 43, method of capture of food, maximum size, and economic role.

Webster, D. A. 1943

Fisheries management studies of Connecticut lakes. Cornell Univ., Ph.D. diss., 210 p.

Catch statistics on several lakes as well as relative susceptibility of female pickerel to ice fishing.

Webster, D. A. 1944

Notes on the food of smallmouth bass (*Micropterus dolomieu*), Columbia Lake, Connecticut. Copeia 1944(2):125-126.

Present in Columbia Lake.

Webster, D. A. 1954

Smallmouth bass, *Micropterus dolomieu*, in Cayuga Lake. Part 1. Life history and environment. Cornell Univ., Agr. Expt. Sta., Memoir 327, 39 p.

E. niger taken at the north end of Cayuga Lake.

Weed, A. C. 1923

Distribution of the pickerels. Copeia no. 115:21-23.

Distribution of *Esox tridecemlineatus* (identified from stock taken from Finger Lakes, N.Y.). Mentions hybrids with *E. americanus*.

Weed, A. C. 1925

Some pickerel names. Copeia no. 144:49-51.

Consideration of synonymy.

Weed, A. C. 1927

Pike, pickerel and muskalonge. Field Mus. Natur. Hist. Chicago, Zool. Leaflet. 9:153-204.

Taxonomic descriptions are given for the *Esox* in North America as well as nomenclature and the various life histories. Hybrids are also discussed.

Welsh, W. W. 1916

Notes on the fishes of the Pee Dee River basin, North and South Carolina.

Copeia no. 33:54-56.

Esox reticulatus in list of fishes observed.

West, J. L. 1968

The growth and reproduction of three intergeneric centrarchid hybrids. North Carolina Univ., Ph.D. diss., 143 p.

Lists all *Esox* hybrids.

Whitaker, J. O., Jr. 1968

Keys to the vertebrates of the eastern United States excluding birds. Minneapolis, Minn., Burgess Publishing Co. 256 p.

Contains key and distribution map (p. 20-21).

Whitworth, W. R., P. L. Berrien and W. T. Keller 1968

Freshwater fishes of Connecticut. Connecticut Geol. and Natur. Hist. Surv., Bull. 101, 134 p.

A map of pickerel distribution in Connecticut is given. A few specific characters are also listed.

Wich, K. and J. W. Mullan 1958

A compendium of the life history and ecology of the chain pickerel *Esox niger* (LeSueur). Massachusetts Div. Fish. Game, Fish Sect., Fish Bull. 2, 23 p.

Information on distribution, morphology, food habits, growth, reproduction, embryology, hybridization, behaviour, populations, disease and parasites (complete list of the parasites reported for the chain pickerel), predators, competitors, and management. Results of studies in Massachusetts are incorporated with other authors' work.

Wightman, P. 1964

The effect of ice-fishing on a chain pickerel (*Esox niger*) population living in competition with other warm-water species. New Hampshire Fish Game Dep., D-J Proj. F-11-R-3, 6 p.

Ice fishing is practised heavily during January. It is suggested that the daily creel limit on pickerel be reduced from 10 to five during January only. Because of growth variance in different ponds, a minimum size does not seem feasible.

Wilde, C. W. 1959

Connecticut State Board of Fisheries and Game. Lake and pond survey unit., D-J Proj. F-4-R, Rep. 1, 395 p.

Williams, J. D. 1968

A new species of sculpin, *Cottus pygmaeus*, from a spring in the Alabama River Basin. Copeia 1968(2):334-342.

E. niger reported in Coldwater Creek, Alabama.

Wilson, C. B. 1903

North American parasitic copepods of the family Argulidae, with a bibliography of the group and a systematic review of all known species. Proc. U.S. Nat. Mus. 25:115-131.

Wollitz, R. E. 1963

Warm water fisheries management investigations. Back Bay fishery investigations. Virginia Comm. Game Inland Fish., D-J Proj. F-5-R-9, Job 10, 22 p.

Wooding, F. H. 1959

The Angler's book of Canadian fishes. Don Mills, Ontario, Collins. 303 p.

Short account on description, distribution, characteristics (including spawning), and angling methods. Several other vernacular names are listed (p. 188-189).

Wootton, D. M. 1957

Notes on the life cycle of *Azygia acuminata* Goldberger, 1911 (Azygiidae-Trematoda). Biol. Bull. 113(2):488-498.

The chain pickerel is listed as a definitive host fish of *Azygia acuminata*.

Wright, A. H. and A. A. Allen 1913

The fauna of Ithaca, N.Y. Fishes. In Field note-book of fishes, amphibians, reptiles and mammals. Ithaca, New York.

Brief mention of habitat, breeding time and place.

Wyatt, H. N. 1968

Southern region fisheries investigations. Life history studies. Georgia Game Fish Comm., D-J Proj. F-19-R-3, wk. pl. 2, Job 3, p. 85-110.

Wyatt, H., D. R. Holder and P. Loska 1970

Southern region fisheries investigations, final report. Georgia State Game Fish Comm., D-J Proj. F-19-R-3 (July 1, 1967-June 30, 1968), 130 p.

Chain pickerel are included in population data presented on various lakes. Additional data is presented on length, weight, condition index, spawning and food of pickerel from the Suwannee River.

Zitko, J., B. J. Finlaysen, D. J. Wildish, J. M. Anderson and A. C. Kohler 1971

Methylmercury in freshwater and marine fishes in New Brunswick, in the Bay of Fundy, and on the Nova Scotia Banks. J. Fish. Res. Board Canada 28(9):1285-1291.

Levels of mercury were measured in freshwater fishes. Freshwater pollution was attributed to industry or airborne mercury.

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Merrilees, M. J., 1972
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- Arve, J. E., 1961, Maryland
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 Livingstone, D. A., 1953, Nova
 Scotia
 McAtee, W. L. and A. C. Weed,
 1915, Maryland
 McCabe, B. C., 1943, Massachu-
 setts
 McCabe, B. C., 1958
 McClane, A. J., 1961
 Mansueti, A. J. and J. D. Hardy,
 Jr., 1967
 Mansueti, R., 1951, Maryland
 Mansueti, R. J., 1962, Maryland
 Mansueti, R. and R. S. Scheltema,
 1953, Maryland
 Meek, A., 1916
 Meek, S. E., 1896, Arkansas
 Montpetit, A. N., 1897, Quebec
 Moody, H. L., 1957, Florida
 Moore, G. A., 1968
 Nash, C. W., 1908, Ontario
 Nash, C. W., 1913, Ontario
 Newell, A. E., 1960
 Odell, T. T., 1932, New York
 Odell, T. T., 1933, New York
 Odell, T. T. and W. C. Senning,
 1938, New York
 Palmer, E. L. and A. H. Wright,
 1920, Georgia
 Pflieger, W. L., 1971, Missouri
 Pickens, A. L., 1928, South Caro-
 lina
 Plummer, J. T., 1851, Indiana
 Ralforth, I., 1944, Ontario
 Raney, E. C., 1950, Virginia
 Raney, E. C., 1951, New York
 Raney, E. C. and W. H. Massman,
 1953, Virginia
 Raver, D., Jr., 1962, North Caro-
 lina
 Reed, R. J., 1971, Massachusetts
 Ross, R. D., 1959 a, Virginia
 Rostlund, E., 1952
 Schrenkeisen, R. M., 1963
 Schwartz, F. J., 1960, Maryland
 Scott, W. B., 1958, Canada

Scott, W. B. and E. J. Crossman,
 1959, New Brunswick
Scott, W. B. and E. J. Crossman,
 1967, Canada
Scott, W. B. and E. J. Crossman,
 1969, Canada
Slasenenko, E. P., 1958, Canada
Smith, C. L., 1962, Kansas
Smith, H. M., 1893 a, North
 Carolina
Smith, H. M., 1893 b
Smith, H. M., 1907, North Caro-
 lina
Simth, H. M. and B. A. Bean,
 1899, District of Columbia
Storer, D. H., 1858, Massachu-
 setts
Stroud, R. H., 1955 a, Massachu-
 setts
Tarzwell, C. M., 1945, Tennessee
Thompson, Z., 1853, Vermont
Todd, F., 1877, Maine
Toner, G. C., 1937, Ontario
Toner, G. C., 1943, Ontario
Tracy, H. C., 1910, Rhode Island
Trautman, M. B., 1957, Ohio
Truitt, R. V., B. A. Bean and
H. W. Fowler, 1929, Maryland
Underhill, A. H., 1948, New York
Webster, D. A., 1944, Connecti-
 cut
Webster, D. A., 1954, New York
Weed, A. C., 1923
Weed, A. C., 1927
Welsh, W. W., 1916, North Caro-
 lina, South Carolina
Whitaker, J. O., Jr., 1968
Whitworth, W. R., P. L. Berrien
and W. T. Keller, 1968, Con-
 necticut
Williams, J. D., 1968, Alabama

Food and Food Habits

Anon., 1871, Massachusetts
Abbott, C. C., 1876
Adams, C. C. and T. L. Hankin-
son, 1928, New York

Bailey, J. R. and J. A. Oliver,
 1939, New Hampshire
Buntz, J., 1967, Florida
Carlander, K. D., 1969
Cooper, G. P., 1942, Maine
Elser, H. J. and R. Mansueti,
 1961, Maryland
Flemer, D. A., 1959, Virginia
Foote, L. E. and P. B. Blake,
 1945, Connecticut
Graff, D. R. and L. Sorenson,
 1970
Gray, J. E. and F. G. Hall, 1929
Harrington, R. W., Jr., 1947
Hunter, G. W., III and J. S.
Rankin, Jr., 1939, Connecticut
Lawrence, J. M., 1960, Alabama
Leach, G. C., 1927
Lewis, G. E., 1971, West Virginia
Lindenberg, J. G., 1970, Massa-
 chusetts
McCabe, B. C., 1958
McCaig, R. S., and J. W. Mullan,
 1960, Massachusetts
McIlwain, T. D., 1970, Missis-
 sippi
Meyers, C. D. and R. J. Muncy,
 1962, Maryland
Pate, V. S. L., 1933, New York
Raney, E. C., 1942, New York
Sanderson, A. E., Jr., 1959,
 Maryland
Scott, W. B., 1967, Eastern
 Canada
Smith, H. M., 1907, North Caro-
 lina
Stroud, R. H., 1955 a, Massachu-
 setts
Underhill, A. H., 1948, New York
Wagner, C. C. and E. L. Cooper,
 1963, Pennsylvania
Walden, H. T., II, 1964
Warner, K., 1973, Maine

Hybrids

Armbruster, D. C., 1960
Armbruster, D., 1966, Ohio

Bailey, R. M., 1938, New Hampshire
Bean, T. H., 1903, New York
Breder, C. M., Jr. and D. E. Rosen, 1966
Buss, K. and J. Miller, 1967, Pennsylvania
Crossman, E. J. and K. Buss, 1965, Pennsylvania, Ontario
Eddy, S., 1940
Emboby, G. C., 1918
Hubbs, C. L., 1955
McCaig, R. S., 1958, Massachusetts
Menzel, B. W. and D. M. Green, Jr., 1972, New York
Migdalski, E. C., 1962
Miller, J. G., 1962, Pennsylvania
Raney, E. C., 1955, Massachusetts
Schwartz, F. J., 1972
Slstenenko, E. P., 1958, Canada
Weed, A. C., 1923
Weed, A. C., 1927
West, J. L., 1968
Wich, K. and J. W. Mullan, 1958, Massachusetts

Life History and Habitat

Adams, C. C. and T. L. Hankinson, 1928, New York
Armbruster, D. C., 1959, Ohio
Barr, L. M., 1962, Maine
Bean, T. H., 1902, New York
Bean, T. H., 1903, New York
Buck, D. H., 1964, Illinois
Buck, D. H., 1965, Illinois
Buck, D. H., 1969, Illinois
Buck, D. H. and C. F. Thoits, III, 1966, Illinois
Buck, D. H. and C. F. Thoits, III, 1967, Illinois
Caine, L. S., 1949
Carlander, K. D., 1969
Chew, R. L., 1967, Florida
Elser, H. J. and R. Mansueti, 1961, Maryland

Foye, R. E. and M. Scott, 1965, Maine
Hoover, E. E., 1937, New Hampshire
Jenkins, R. E., E. A. Lachner and F. J. Schwartz, 1970
Kendall, W. C., 1917
Lewis, G. E., 1971, West Virginia
McCabe, B. C., 1958
Mansueti, A. J. and R. J. Mansueti, 1955
Mansueti, A. J. and J. D. Hardy, Jr., 1967
Meek, A., 1916
Migdalski, E. C., 1962
Miller, L. F., 1945, Tennessee
Raver, D., Jr., 1962, North Carolina
Reid, G. K., Jr., 1950, Florida
Ryder, J. A., 1887
Saila, S. B. and D. Horton, 1957, Rhode Island
Sanderson, A. E., Jr., 1950, Maryland
Schwartz, F. J., 1960, Maryland
Schwartz, F. J., 1964, Chesapeake, Delaware bays
Scott, W. B., 1967, Eastern Canada
Slstenenko, E. P., 1958, Canada
Smith, M. W., 1939, Nova Scotia
Smith, R. F., 1955, New Jersey
Tarzwell, C. M., 1959
Thoits, C. F. and D. H. Buck, 1966, Illinois
Tompkins, W. A., 1953, Kentucky
Trippensee, R. E., 1953
Underhill, A. H., 1948, New York
Underhill, A. H., 1949, New York
Webster, D. A., 1942 b, Connecticut
Wich, K. and J. W. Mullan, 1958, Massachusetts
Wyatt, H. N., 1968, Georgia

Management

Anon., 1870, Massachusetts
Anon., 1950, New Jersey

- Anon.**, 1959, Connecticut
Anon., 1968, Louisiana
Bailey, J. R. and J. A. Oliver,
1939, New Hampshire
Buck, D. H., 1969, Illinois
Cobb, K., 1934, Connecticut
Corning, R. V., 1967 a, Virginia
Davis, J. T. and J. S. Hughes,
1968, Louisiana
Doxtater, G., 1967, Indiana
Embod, G. C., 1915
Everhart, W. H. and G. A.
Rounsefell, 1953
Faigenbaum, H. M., 1933, New
York
Forste, F. H., 1969, New Hamp-
shire
Funk, J. L., 1954, Missouri
Funk, J. L., 1955 a, Missouri
Funk, J. L., 1955 b, Missouri
Green, D. M., Jr., 1967, New
York
Green, D. M., Jr., 1968, New
York
Green, D. M., Jr., 1970, New
York
Green, D. M., Jr., 1971, New
York
Green, D. M., Jr., 1972, New
York
Greene, C. W., R. P. Hunter and
W. C. Senning, 1933, New York
Grice, F., 1962, Massachusetts
Herke, W. H., 1959, Florida
Hoffmann, C. H. and E. W.
Surber, 1948, West Virginia
Holder, D. R., 1970
Incerpi, A., 1964, Maine
Jerome, W. C., 1962 a, New
Hampshire
Jerome, W. C., 1962 b, New
Hampshire
Kendall, W. C., 1913
Kendall, W. C., 1918, Maine
Kirkland, A. L., 1923, Georgia
Lagler, K. F., 1956
Lambou, V. W., 1959, Louisiana
McCabe, B. C., 1952, Massachu-
setts
McCabe, B. C., 1953, Massachu-
setts
McCabe, B. C. and A. H. Swartz,
1952, Massachusetts
Odell, T. T. and W. C. Senning,
1938, New York
Prosser, N. S., 1968, Virginia
Ross, R. D. and G. E. Lewis,
1971, West Virginia
Rupp, R. S. and S. S. DeRoche,
1965, Maine
Saila, S. B., 1956, Rhode Island
Saila, S. B. and D. Horton, 1957,
Rhode Island
Seaman, E. A. and E. W. Surber,
1949, West Virginia
Sheridan, J. R., 1961, Virginia
Sheridan, J. R., 1962 a, Virginia
Sheridan, J. R., 1962 b, Virginia
Sheridan, J. R., 1963, Virginia
Smith, M. W., 1941, New Bruns-
wick
Smith, R. F., 1953, New Jersey
Smith, R. F. and R. W. Gross,
1955, New Jersey
Stroud, R. H., 1953 a, Massachu-
setts
Stroud, R. H., 1953 b, Massachu-
setts
Stroud, R. H., 1955 a, Massachu-
setts
Stroud, R. H., 1955 b, Massachu-
setts
Stroud, R. H., 1970, Vermont
Stroud, R. H. and H. Bitzer, 1955
Sullivan, C. R., 1956, West Vir-
ginia
Surber, E. W. and D. D. Friddle,
1949, West Virginia
Tarzwel, C. M., 1942, Tennessee
Tarzwel, C. M., 1945, Tennessee
Thorpe, L. M., 1942, Connecticut
Trippensee, R. E., 1953
Underhill, A. H., 1949, New York
Webster, D. A., 1943, Connecticut

Wightman, P., 1964, New Hampshire
 Wyatt, H., D. R. Holder and P. Loska, 1970, Georgia
 Zitko, J., B. J. Finlayson, D. J. Wildish, J. M. Anderson and A. C. Kohler, 1971, New Brunswick

Parasites, Pathology and Diseases

Baker, F. C., 1916, New York
 Baker, F. C., 1918, New York
 Bangham, R. V., 1941, Florida
 Bean, T. H., 1902, New York
 Buck, D. H. and C. F. Thoits, III, 1970, Illinois
 Davis, R. M., 1967, Maine
 Foote, L. E. and B. P. Blake, 1945, Connecticut
 Foye, R. E. and M. Scott, 1965, Maine
 Goldberger, J., 1911
 Haley, A. J. and H. S. Winn, 1959, Maryland
 Hoffman, G. L., 1967
 Hunter, G. W. III, 1942, Connecticut
 Hunter, G. W. III and W. S. Hunter, 1931
 Hunter, G. W. III and J. S. Rankin, Jr., 1940
 Knapp, F. T., 1951, Texas
 LaRue, G. R., 1914
 Leidy, J., 1889
 McCabe, B. C., 1958
 Manther, H. W., 1926
 Meyer, M. C., 1962
 Morrison, G. R., 1957, New Hampshire
 Mueller, J. F., 1931
 Mueller, J. F., 1932, New York
 Mueller, J. F. and H. J. Van Cleave, 1932, New York
 Pratt, H. S., 1923
 Sindermann, C. J., 1953, Massachusetts

Surber, E. W. and D. D. Friddle, 1949, West Virginia
 Van Cleave, H. J., 1923
 Van Cleave, H. J. and J. F. Mueller, 1932, New York
 Van Cleave, H. J. and J. F. Mueller, 1934, New York
 Ward, H. B., 1910
 Ward, H. B., 1912
 Wich, K. and J. W. Mullan, 1958, Massachusetts
 Wilson, C. B., 1903

Popular Accounts

Anon., (no date), Quebec
 Anon., 1960
 Caine, L. S., ed., 1949
 Carpenter, C., 1965, Texas
 Chalmers, T., 1879
 Circle, H., (no date)
 Cooper, A., 1971
 Dalrymple, B., 1968
 Dolan, T., 1960
 Gooch, B., 1967 a, North Carolina
 Gooch, B., 1967 b
 Grosvenor, M. B., ed., 1965
 Hackney, P. A., 1968, Alabama
 Henshall, J. A., 1903
 Hutt, A., 1967, Florida
 Kemp, R., 1952, Texas
 La Monte, F., 1945
 McCarragher, D. B., 1965
 McClane, A. J., 1947
 McClane, A. J., 1961
 McClane, A. J., ed., 1965
 Mélançon, C., 1968, Quebec
 Miller, J., 1970, Pennsylvania
 Montross, L., 1937
 Morgan, A. H., 1930
 Muir, R., 1967, New Jersey
 Musick, J. A., 1962, New Jersey
 Needham, J. G., 1920, New York
 Ommanney, F. D., 1969
 Orr, R. T., 1966
 Phillips, J., 1960
 Prince, A. W., 1965
 Raney, E. C., 1950, Virginia

Reece, M., 1963
 Roy, J. M. and G. Beaulieu, 1965,
 Quebec
 Sammuels, E. A., 1902
 Schreitmüller, W., 1915, Germany
 Smith, O. W., 1922
 Thoreau, H. D., 1859
 Tomlin, W. D., 1892
 Ward, H. B., 1919, New York
 Wooding, F. H., 1959, Canada
 Wright, A. H. and A. A. Allen,
 1913, New York

Predation

Anon. (W.W.E.), 1874
 Abbott, C. C., 1876
 Buck, D. H. and C. F. Thoits III,
 1970, Illinois
 Crossman, E. J., 1962 c
 Doxtater, G., 1967, Indiana
 Keith, W. E. and S. W. Barkley,
 1971, Arkansas
 Reed, J. R., 1969
 Warner, K., 1972, Maine
 Warner, K., R. P. Auclair, S. E.
 De Roche, K. A. Harvey and
 C. F. Ritzi, 1968

Taxonomy, Nomenclature, and Systematics

Anon., 1877
 Anon., 1902 a
 Anon., 1902 b
 Adams, C. C. and T. L. Hankin-
 son, 1928, New York
 Agassiz, L., 1854, Tennessee
 Ayres, W. O., 1843
 Bailey, R. M., J. E. Fitch, E. S.
 Herald, E. A. Lachner, C. C.
 Lindsey, C. R. Robins and
 W. B. Scott, 1970
 Bailey, R. M., H. E. Winn and
 C. L. Simth, 1954, Alabama,
 Florida
 Beamish, R. J., M. J. Merrilees
 and E. J. Crossman, 1971

Bean, T. H., 1891
 Bean, T. H., 1897 a, New York
 Bean, T. H., 1897 b, New York
 Bean, T. H., 1902, New York
 Boschung, H. T., Jr., 1961,
 Alabama
 Buss, K. and J. Miller, (no date) b,
 Pennsylvania
 Caine, L. S., 1949
 Carpenter, R. G. and H. R.
 Siegler, 1947, New Hampshire
 Carr, A. F., Jr., 1936, Florida
 Carr, A. and C. J. Goin, 1955,
 Florida
 Cope, E. D., 1869
 Crossman, E. J., 1960
 Crossman, E. J., 1962 a, Canada
 Crossman, E. J., 1962 b, North
 Carolina
 Crossman, E. J., 1966
 Cuvier, G. and M. A. Valen-
 ciennes, 1846
 Davisson, M. T., 1972
 DeKay, J. E., 1842
 Dymond, J. R., 1947, Canada
 Eddy, S., 1957
 Evermann, B. W., 1898
 Evermann, B. W., 1902
 Gill, T. N., 1896
 Gill, T. N., 1898
 Girard, C. F., 1854
 Girard, C., 1856, Massachusetts
 Günther, A., 1866
 Hazzard, A. S., K. Buss and J.
 Miller, (no date), Pennsylvania
 Henshall, J. A., 1919
 Herbert, H. W., 1859
 Hildebrand, S. F. and W. C.
 Schroeder, 1928, Chesapeake
 Bay
 Holbrook, J. E., 1860, South
 Carolina
 Hubbs, C., 1972, Texas
 Jordan, D. S., 1882, Ohio
 Jordan, D. S., 1884
 Jordan, D. S., 1905
 Jordan, D. S., 1917

- Jordan, D. S.**, 1918
Jordan, D. S., 1925
Jordan, D. S., 1929
Jordan, D. S. and B. W. Evermann, 1896 a
Jordan, D. S. and B. W. Evermann, 1896 b
Jordan, D. S. and B. W. Evermann, 1923
Jordan, D. S., B. W. Evermann and H. W. Clark, 1930
Jordan, D. S. and C. H. Gilbert, 1883
Karvelis, E. G., 1964
Kirtland, J. P., 1844
Kirtland, J. P., 1854, Ohio
Knapp, F. T., 1953, Texas
Kuhne, E. R., 1939 a, Tennessee
Kuhne, E. R., 1939 b, Tennessee
Lesueur, C. A., 1818
Mitchill, S. L., 1814, New York
Montpetit, A. N., 1897, Quebec
Moore, G. A., 1968
Nelson, G. J., 1972
Nikol'skii, G. V., 1961
Pflieger, W. L., 1966, Missouri
Pflieger, W. L., 1971, Missouri
Rover, D., Jr., 1962, North Carolina
Richardson, L. R., 1935, Quebec
Ross, R. D., 1959 b, Virginia
Schwartz, F. J., 1960, Maryland
Scott, W. B., 1958, Canada
Scott, W. B., 1967, Eastern Canada
Scott, W. B. and E. J. Crossman, 1967, Canada
Scott, W. B. and E. J. Crossman, 1969, Canada
Senton, A. H. and M. M. Stewart, 1971
Sexton, A. D., 1963
Slastenenko, E. P., 1958, Canada
Smith, H. M., 1907, North Carolina
Smith-Vaniz, W. F., 1968, Alabama
Starks, E. C., 1904
Storer, D. H., 1844
Storer, D. H., 1846
Storer, D. H., 1858
Thompson, Z., 1842, Vermont
Thompson, Z., 1853, Vermont
Trautman, M. B., 1957, Ohio
Underhill, A. H., 1948, New York
Weed, A. C., 1925
Weed, A. C., 1927
Whitaker, J. O., Jr., 1968
Whitworth, W. R., P. L. Berrien and W. T. Keller, 1968, Connecticut
Wooding, F. H., 1959, Canada