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Annotated Bibliography on the Biology of the Menhaden, Genus Brevoortia, 1981-1987

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ABSTRACT

This bibliography consists of 103 references on taxonomy, life history, management and ecology of menhadens, genus Brevoortia, published in journals, books, and reports to commissions. Also included are major secondary references to fish oils and surimi. This bibliography includes only references from 1981 through 1987. Annotations and a subject index are included.

INTRODUCTION

This bibliography is a continuation of those compiled by Reintjes et al. (1960), Reintjes (1964) and Reintjes and Keney (1975), which cover 1963 through 1973 on the biology of menhadens, genus Brevoortia, as well as Manooch and Reintjes (in prep.) which covers 1974 through 1980. In general, all literature concerning menhaden biology have been included: taxonomy, physiology, life history, ecology, and management. Papers where menhaden are referred to incidentally have not been included. Also included are major secondary references to fish oils (Bauersfeld and Winemiller 1985) and surimi (Sonu 1986) articles.

Arrangement of the references is alphabetical by author's surname. Where multiple authors are involved, entry is made under the senior author's name but the other authors are included. Each author's works are listed chronologically by year of publication and those published in the same year are given alphabetical sequence by title. Anonymous articles are listed by name of the journal or the originating agency.

Annotations of the contents of the publications have been taken from the abstracts or introduction. This bibliography attempts to provide a brief description of the literature.

I would like to thank Ann Manooch, librarian, and the staff at the Beaufort Laboratory for the help I received.

BIBLIOGRAPHY

Ahrenholz, D. W.

1981. Recruitment and exploitation of gulf menhaden, Brevoortia patronus. U.S. National Marine Fisheries Service, Fishery Bulletin 79:325-335.

Rates of exploitation, population movement and recruitment into the fishery were estimated from returns of tagged juveniles and adults.

Ahrenholz, D. W., J. F. Guthrie, and R. M. Clayton.

1987. Observations of ulcerative mycosis infections on Atlantic menhaden (Brevoortia tyrannus). NOAA Technical Memorandum NMFS-SEFC-196. 28 p.

Observations of ulcerative mycosis infections of Atlantic menhaden that were made ancillary to juvenile abundance sampling and tagging activities are summarized. Geographic areas of primary infection are tentatively identified.

Ahrenholz, D. W., W. R. Nelson, and S. P. Epperly.

1987. Population and fishery characteristics of Atlantic menhaden, Brevoortia tyrannus. U.S. National Marine Fisheries Service, Fishery Bulletin 85:569-600.

A stock analysis of the Atlantic menhaden, Brevoortia tyrannus, fishery was conducted with purse seine landings data from 1940 to 1981 and port sampling data from 1955 to 1981.

Atlantic Menhaden Management Board.

1981. Fishery management plan for Atlantic menhaden, Brevoortia tyrannus (Latrobe).

Atlantic State Marine Fisheries Commission, Washington, D.C. 134 p.

Measures, requirement conditions or restrictions specified to attain management objectives and recommended option.

Atlantic Menhaden Management Board.

1986. Supplement to Atlantic Menhaden Fishery Management Plan.

Atlantic States Marine Fisheries Commission, Fisheries Management Report No. 8. 61 p.

Primarily a database update (1981-86), this supplement also summarizes a stock assessment of the Atlantic menhaden and potential effects of a coastwide season closure recommended in 1982.

Bauersfeld, P. E., and L. F. Winemiller.

1985. A selected bibliography on fish oils.

NOAA Technical Memorandum NMFS-SEFC-166. 345, 59 p.

References are listed for 5700 scientific/technical articles on fish oils published from 1878 to 1985.

Blomo, V. J.

1987. Distribution of economic impacts from proposed conservation measures in the U.S. Atlantic menhaden fishery.

Fisheries Research 5:23-28.

Economic impacts are examined by a bio-economic model using a time-dynamic and geography-specific framework.

Blomo, V. J., and N. Crouse.

1984. Economic impact of a closed corridor on the North Carolina menhaden fishery.

University of North Carolina Sea Grant College, Publication UNC-SG-84-4. 29 p.

An economic analysis of the impact of a closed corridor management option for the Atlantic menhaden reduction fishery is presented. This option was one of several considered by the Atlantic Menhaden Management Board in 1982.

Blomo, V. J., M. Orbach, J. Maiolo, and N. Crouse.

1985. Socioeconomic impact of a shortened North Carolina menhaden season.

University of North Carolina Sea Grant College, Special Scientific Report No. 45. 51 p.

An economic analysis of the impact of an area-specific shortened season management option for the Atlantic menhaden reduction fishery is presented. This option was adopted by the Atlantic States Fisheries Management Commission in 1982.

Blomo, V. J., and N. C. White.

1986. A productivity analysis of major North Carolina commercial fisheries.

UNC Sea Grant College Publication UNC-SG-86-2. 40 p.

This analysis will aid in evaluating the feasibility of intensifying existing fisheries and/or incorporating new species which could supplement or replace existing ones.

Chester, A. J.

1984. Sampling statistics in the Atlantic menhaden fishery.

NOAA Technical Report NMFS 9. 16 p.

The sampling program and statistics for estimating numbers of fish landed at each age in the menhaden purse-seine fishery along the U.S. east coast, are evaluated for precision and possible bias (especially during the North Carolina Fall fishery).

Chester, A. J., and J. R. Waters.

1985. Two-stage sampling for age distribution in the Atlantic menhaden fishery, with comments on optimal survey design.

North American Journal of Fisheries Management 5:449-456.

Principles of probability sampling theory and optimization of survey design have been applied to the estimation of age composition in the Atlantic menhaden purse-seine fishery.

Christmas, J. Y., D. J. Etzold, and L. B. Simpson.

1983. The menhaden fishery of the Gulf of Mexico, United States.

Gulf States Marine Fisheries Commission No. 8. 107 p.

A major revision of the 1977 fishery management plan is presented including updated data and analyses.

Christmas, J. Y., J. T. McBee, R. S. Waller, and F. C. Sutter, III.

1982. Habitat suitability index models: Gulf menhaden.

U.S. Fish and Wildlife Service FWS/OBS-82/10.23. 23 p.

A report intended for use in impact assessment and coastal habitat management, summarizes basic life history information.

Condrey, R. E.

1983. Population models applied to selected management questions in the U.S. Gulf of Mexico fisheries

Louisiana State University, Coastal Ecology Laboratory, Fisheries Report No. 83-2. 40 p.

The study was designed to assess the change in yield associated with existing state laws.

Condrey, R. E.

1984. Density-dependent searching time: Implications in surplus-production models.

U.S. National Marine Fisheries Service, Fishery Bulletin 82:449-453.

An initial theoretical consideration is presented to show how density-dependent searching time can be incorporated into surplus-production models of fisheries.

Condrey, R. E., and R. E. Turner.

1982. Evaluation of the brine disposal from the West Hackberry site: the regional impact on menhaden resources, final report.

Louisiana State University, Center for Wetland Resources, Baton Rouge, for Louisiana Department of Wildlife and Fisheries and Strategies Petroleum Reserve Project Management Office as part of Louisiana Department of Wildlife and Fisheries and U.S. Department of Energy Cooperative Agreement No. DE-FC96-81P010313. 2 vols.

Volume I of this report is concerned with the distribution of larval gulf menhaden relative to proposed brine disposal. The distribution of larval gulf menhaden was found to be influenced by currents, chemistry, and plankton.

Cross, F. A., D. S. Peters, and W. E. Schaaf.

1985. Implications of waste disposal in coastal waters on fish populations. Aquatic toxicology and hazard assessment, 7th Symposium. In R. D. Cardwell, R. Purdy, and R. C. Bahner, eds. American Society for Testing and Materials, Philadelphia, p. 383-399.

Scenarios were developed using a density-independent Leslie matrix model and data from the Atlantic menhaden fishery to simulate population responses to both catastrophic and chronic mortalities.

Deegan, L. A.

1984. Abundance, size, growth and mortality of juvenile gulf menhaden in Fourleague Bay, Louisiana.

Final report to Louisiana State University, Coastal and Marine Fisheries Program, Baton Rouge. 23 p.

Report presents calculations on the abundance and distribution by size, and estimates growth and mortality rates.

Deegan, L. A.

1985. The population ecology and nutrient transport of gulf menhaden in Fourleague Bay, Louisiana.

Ph.D. Thesis, Louisiana State University, Baton Rouge. 134 p.

This study documents young of the year gulf menhaden population ecology, migration, growth, mortality and life history.

Deegan, L. A.

1986. Changes in body composition and morphology of young-of-the-year menhaden, Brevoortia patronus Goode, in Fourleague Bay, Louisiana.

Journal of Fish Biology 29:403-415.

Analysis of the weight-length relationship indicated separate equations for larvae, postlarvae and juvenile subadults.

Deegan, L. A., and B. A. Thompson.

1987. Growth rate and life history events of young-of-the-year gulf menhaden as determined from otoliths.

Transactions of the American Fisheries Society 116:663-667.

Growth rates and life history were determined in Fourleague Bay, Louisiana, from studies of sagittal otoliths.

Ditty J. G.

1986. Ichthyoplankton in neritic waters of the northern Gulf of Mexico off Louisiana: Composition, relative abundance, and seasonality.

U.S. National Marine Fisheries Service, Fishery Bulletin 84:935-944.

Ichthyoplankton samples collected monthly between November 1981 and October 1986 showed that the five most abundant taxa in order of decreasing abundance were anchovies, Atlantic croaker, Atlantic thread herring, gulf menhaden and Atlantic bumper.

Durbin, A. G., E. G. Durbin, T. J. Smayda, and P. G. Verity.

1983. Age, size, growth, and chemical composition of Atlantic menhaden, Brevoortia tyrannus, from Narragansett Bay, Rhode Island.

U.S. National Marine Fisheries Service, Fishery Bulletin 81:133-141.

Age and size were determined for 2,105 menhaden; age 2 and 3 were predominant. Chemical composition for ash, carbon, and nitrogen were determined.

Durbin, E. G., and A. G. Durbin.

1981. Assimilation efficiency and nitrogen excretion of a filter-feeding planktivore, the Atlantic menhaden, Brevoortia tyrannus (Pisces: Clupeidae).

U.S. National Marine Fisheries Service, Fishery Bulletin 79:601-616.

Experiments conducted with adult menhaden follow the time course of changes in feces elimination rate.

Durbin, E. G., and A. G. Durbin.

1983. Energy and nitrogen budgets for the Atlantic menhaden, Brevoortia tyrannus (Pisces: Clupeidae), a filter-feeding planktivore.

U.S. National Marine Fisheries Service, Fishery Bulletin 81:177-199.

Experimentally derived energy and nitrogen budgets for menhaden permit a detailed investigation of their food consumption rate, energy expenditures, growth rate and growth efficiency.

Dykstra, M. J., E. J. Noga, J. F. Levine, D. W. Moye, and J. H. Hawkins.

1986. Characterization of the Aphanomyces species involved with ulcerative mycosis (UM) in menhaden.

Mycologia 78:664-672.

One of the Aphanomyces isolates was selected for culture studies which revealed that the fungus was stimulated to increased vegetative growth and improved zoosporulation by low levels of salinity.

Engel, D. W., W. F. Hettler, L. C. Clements, and D. E. Hoss.

1987. The effect of abrupt salinity changes on the osmoregulatory abilities of the Atlantic menhaden Brevoortia tyrannus.

Comparative Biochemistry and Physiology 86A:723-727.

Changes in osmotic pressure and concentrations of sodium, potassium, chloride and free amino acids in blood serum and axial muscle were measured for up to a week following abrupt salinity changes.

Epperly, S. P., W. H. Lenarz, L. L. Massey, and W. R. Nelson.

1986. A generalized computer program for yield per recruit analysis of a migrating population with area specific growth and mortality rates.

NOAA Technical Memorandum NMFS-SEFC-180. 26 p.

This is a yield per recruit computer program (MAREA) for yield per recruit of a stock fished over multiple areas. This program was developed from MGEAR for use with the Atlantic menhaden fishery.

Ferraro, S. P.

1981. Eggs and larvae of the Atlantic menhaden (Brevoortia tyrannus) in the Peconic Bays, New York in 1972-74.

Conseil International pour l'Exploration de la Mer, Rapports et Proces-Verbaux des Reunions 178:181-182.

Distribution and abundance of menhaden eggs and larvae were determined from plankton collections in Peconic Bays, New York.

Friedland, K. D.

1985a. Correlation between the local distribution patterns of the filter-feeding fish Brevoortia tyrannus (Pisces: Clupeidae) and plankton related gradients.

Estuaries 8(2B):18A (Abstract).

Concurrent synoptic observation of the relative abundance of menhaden and parameters relevant to characterizing production along transects in estuarine creek ecosystems were used to interpret the fish's local distribution.

Friedland, K. D.

1985b. Functional morphology of the branchial basket structures associated with feeding in the Atlantic menhaden, Brevoortia tyrannus (Pisces: Clupeidae).

Copeia 1985:1018-1027.

Atlantic menhaden juveniles were studied with light and scanning electron microcope for size of to food-particle captured and transport of food.

Friedland, K. D., L. W. Hass, and J. V. Merriner.

1984. Filtering rates of the juvenile Atlantic menhaden Brevoortia tryannus (Pisces: Clupeidae), with consideration of the effects of detritus and swimming speed.

Marine Biology 84:109-117.

Feeding experiments were conducted with 138 mm fork length menhaden to determine their particle size-specific feeding abilities.

Govoni, J. J.

1983. Helminth parasitism of three larval fishes in the northern Gulf of Mexico.

U.S. National Marine Fisheries Service, Fishery Bulletin 81:895-898.

Menhaden, spot and croaker were examined. Helminths occurred primarily in the midgut.

Govoni, J. J., D. E. Hoss, and A. J. Chester.

1983. Comparative feeding of three species of larval fishes in the northern Gulf of Mexico: Brevoortia patronus, Leiostomus xanthurus, and Micropogonias undulatus.

Marine Ecology Progress Series 13:189-199.

Comparative diets of the three species by length and size indicate that the three species do not compete for food.

Greenwood, C., and Q. H. Gibson.

1983. Circular dichromism and conformation of fish hemoglobins. Journal of Biological Chemistry 258:4171-4176.

Quantitative studies of hemoglobin from bluefin tuna and menhaden have given estimates of the allosteric parameters which describe ligand binding.

Guillory, V., J. Geaghan, and J. Roussel.

1983. Influence of environmental factors on gulf menhaden recruitment. Louisiana Department of Wildlife and Fisheries, Technical Bulletin No. 37. 32 p.

The relationship between gulf menhaden (Brevoortia patronus) recruitment, as measured by catch-per-effort of age-1 fish in the commercial fishery, and 11 different environmental factors were analyzed.

Guillory, V., and G. Hutton.

1982. A survey of bycatch in the Louisiana gulf menhaden fishery. Proceedings of the Annual Conference, Southeastern Association of Fish and Wildlife Agencies 36:213-223.

A survey of incidental catch in the menhaden purse-seine fishery, where bycatch was 2.68% by number and 2.35% by weight.

Hall, L. W. Jr., D. T. Burton, W. C. Graves, and S. L. Margrey.

1984. Avoidance responses of estuarine fish exposed to heated-dechlorinated power plant effluents. Environmental Science Technology 18:561-566.

Menhaden showed minimal avoidance to dechlorinated estuarine water at all acclimation temperatures.

Hall, L. W. Jr., D. T. Burton, S. L. Margrey, and W. C. Graves.

1982. A comparison of the avoidance responses of individual and schooling juvenile Atlantic menhaden, Brevoortia tyrannus, subjected to simultaneous chlorine and elevated temperature conditions.

Journal of Toxicology and Environmental Health 10:1017-1026.

The objectives of this study were to determine and compare the avoidance responses of individual and groups of Atlantic menhaden, exposed to simulataneous elevated temperature and total residual chlorine conditions.

Hall, L. W. Jr., A. E. Pinkney, S. Zeger, D. T. Burton, and M. J. Lenkevich.

1984. Behavioral responses to two estuarine fish species subjected to bis (tri-n-butylin) oxide.

Water Resources Bulletin 20:235-239.

The objective of this study was to evaluate the avoidance responses of juvenile striped bass, Morone saxatilis and Atlantic menhaden, Brevoortia tyrannus to bis (tri-n-butyltin) oxide.

Hanson, P. J., and D. E. Hoss.

1986. Trace metal concentrations in menhaden larvae Brevoortia patronus from the northern Gulf of Mexico.

Estuarine, Coastal and Shelf Science 23:305-315.

Menhaden larvae have metal concentrations comparable to other species of larval fish.

Hargis, W. J., Jr.

1985. Quantitative effects of marine diseases on fish and shellfish populations.

Transactions of the North American Wildlife and Natural Resources Conference 50:608-640.

The importance of the several components of natural mortality in population dynamics is discussed.

Hettler, W. F.

1981. Spawning and rearing Atlantic menhaden.

Progressive Fish-Culturist 43:80-84.

Spawning is induced by injecting human chorionic gonadotropin and then carp pituitary.

Hettler, W. F.

1983. Transporting adult and larval gulf menhaden and techniques for spawning in the laboratory.

Progressive Fish Culturist 45:45-48.

Life-support features, shipping tanks and spawning techniques are discussed.

Hettler, W. F.

1984. Description of eggs, larvae and early juveniles of gulf menhaden, Brevoortia patronus, and comparisons with Atlantic menhaden, B. tyrannus, and yellowfin menhaden, B. smithi.

U.S. National Marine Fisheries Service, Fishery Bulletin 82:85-95.

Larvae of these species can be distinguished from each other by the number of myomeres and vertebrae.

Hope, S. J.

1981. Holding Atlantic menhaden in a closed system for environmental research. Progressive Fish-Culturist 44:50-52.

A study was conducted to evaluate the potential effectiveness of screens, barriers and fish pumps in preventing fish losses at power plants.

Hoss, D. E., and J. H. S. Blaxter.

1982. Development and function of the swimbladder-inner ear-lateral line system in the Atlantic menhaden, Brevoortia tyrannus (Latrobe). Journal of Fish Biology 20:131-142.

The swimbladder-acoustico-lateralis system of the Atlantic menhaden is described and compared with the Atlantic herring, Clupea harengus.

Hoss, D. E., and G. Phonlor.

1984. Field and laboratory observations on diurnal swim bladder inflation-deflation in larvae of gulf menhaden, Brevoortia patronus. U.S. National Marine Fisheries Service, Fishery Bulletin 82:513-517.

Laboratory and sea experiments demonstrate that the larvae fill their swim bladders at night by swallowing air.

Hu, T. W., D. R. Whitaker, and D.L. Kaltreider.

1983. U.S. menhaden industry: An economic profile for policy and regulatory analysts. National Fisheries Institute, Inc. 60 p. (NTIS order No.: PB83-165720)

The business environment of the menhaden processor is presented from an integrated perspective which addresses the resource, harvesting, processing, and marketing practices.

Jensen, A. L.

1985. Time series analysis and the forecasting of menhaden catch and CPUE.

North American Journal of Fisheries Management 5:78-85.

Catch and catch per unit of effort data for Atlantic and gulf menhaden were analyzed with autocorrelation to test for time lags and to develop forecasting equations.

Joseph, J. D.

1985. Fatty acid composition of commercial menhaden, Brevoortia spp., oils, 1982 and 1983.

U.S. National Marine Fisheries Service, Marine Fisheries Review 47(3):30-37.

Fatty acid composition of oil samples, 65 in 1982 and 63 in 1983, were determined by Gas-Liquid Chromatography on flexible fused silica, high-resolution capillary columns.

Judy, M. H., and R. M. Lewis.

1983. Distribution of eggs and larvae of Atlantic menhaden, Brevoortia tyrannus, along of the Atlantic coast of the United States.

NOAA Technical Report NMFS-SSRF-774. 23 p.

Atlantic menhaden, eggs and/or larvae were collected during 52 ocean cruises by 12 vessels from 1953 to 1975.

Jurkowski, J. J., and W. T. Cave, Jr.

1985. Dietary effects of menhaden oil on the growth and membrane lipid composition of rat mammary tumors.

Journal of the National Cancer Institute 74:1145-1150.

The results indicated that diets containing 20% menhaden oil produced a reduction in tumor incidence and a prolongation of the tumor latent period. This finding contrasted sharply with observed animals fed the equivalent dietary level of corn oil.

Lanier, T.

1985. Menhaden: Soybean of the sea.

University of North Carolina Sea Grant College, Publication UNC-SG-85-02. 24 p.

The article gives an historical review of the fishery and the many uses of the animal.

Lasker, R., and K. Sherman.

1981. Eggs and larvae of Atlantic menhaden (Brevoortia tyrannus) in the Peconic Bays, New York in 1972-74.

Rapports et Prces-Verbarrx des Reunions Conseil International pur l' Exploration de la Mer 178: 181-182.

Distribution and abundance of Atlantic menhaden Brevoortia tyrannus eggs and larvae were determined by data from plankton collections taken from mid spring to late autumn.

Lassuy, D. R.

1983. Gulf menhaden.

U.S. Fish and Wildlife Service, FWS/OBS-82/11.2 13 p.

Coastal managers, engineers and field biologists are provided with an introduction to the subject species, summarizing life history information.

Lewis, R. M., D. W. Ahrenholz, and S. P. Epperly.

1987. Fecundity of Atlantic menhaden, Brevoortia tyrannus

Estuaries 10:347-350.

Because of high rates of exploitation during the 1960's and continued exploitation in the 1970's the length and age at first spawning were reexamined during the 1978, 1979, and 1981 fishing season to detect possible changes in the reproductive biology.

Lewis, R. M., and C. M. Roithmayr.

1981. Spawning and sexual maturity of gulf menhaden, Brevoortia patronus. U.S. National Marine Fisheries Service, Fishery Bulletin 78: 947-951.

Number of maturing ova for specific age-groups, percentage of fish that spawn at each age, time of spawning and frequency are estimated.

Lewis, V. P., and D. S. Peters.

1984. Menhaden - A single step from vascular plant to fishery harvest. Journal of Experimental Biology and Ecology 84:95-100.

An efficient direct link from marsh production to fishery utilization by juvenile Atlantic menhaden is demonstrated.

Linder, E., G. P. Patil, and D. S. Vaughan.

1987. Application of event tree risk analysis to fisheries management. Ecological Modelling 36:15-28.

The assessment of event tree analysis couches the uncertainty of projections in terms of relative risk associated with various management options.

Manooch, A. B., and J. W. Reintjes.

(In Preparation). Annotated bibliography on the biology of the menhaden, 1974-1980.

Annotated bioliography of menhaden Brevoortia species.

Margraf, F. J., D. M. Chase, and K. Straw.

1985. Intake screens for sampling fish populations: The size-selectivity problem.

North American Journal of Fisheries Management 5:210-213.

Intake screens at generating stations were concluded to be a practical means of sampling fish populations.

McHugh, J. L.

1981. Marine Fisheries of Delaware.

U.S. National Marine Fisheries Service, Fishery Bulletin 79:575-600.

About 85 species have been recorded in commercial and recreational fisheries. Production of commercial fisheries has dropped due to the decline of the dominant menhaden fishery.

Medved, R. J., and J. A. Marshall.

1983. Short-term movements of young sandbar sharks, Carcharhinus plumbeus (Pisces, Carcharhinidae).

Bulletin of Marine Science 33:87-93.

Movement rarely occurred against tidal flow and was associated with slow current speed and the proximity of large schools of menhaden.

Medved, R. J., C. E. Stillwell, and J. J. Casey.

1985. Stomach contents of young sandbar sharks, Carcharhinus plumbeus, in Chincoteague Bay, Virginia.

U.S. National Marine Fisheries Service, Fishery Bulletin 83:395-402.

The stomach contents of 414 sharks were examined. Atlantic menhaden occurred in 13.3% of the stomachs.

Nelson, W. R., and D. W. Ahrenholz.

1986. Population and fishery characteristics of gulf menhaden, Brevoortia patronus.

U.S. National Marine Fisheries Service, Fishery Bulletin 84:311-325.

Landing data from 1964 to 1978 for the purse-seine fishery in the north-central Gulf of Mexico for gulf menhaden, Brevoortia patronus, were analyzed to determine growth rate, yield-per-recruit and spawner-recruit relationships, and maximum sustainable yield (MSY).

Noga, E. J., and M. J. Dykstra.

1986. Oomycete fungi associated with ulcerative mycosis in menhaden, Brevoortia tyrannus (Latrobe).

Journal of Fish Diseases 9:47-53.

Oomycete fungi were found in over 95% of all deep lesions and necrotic ulcers in Atlantic menhaden, and more than one species of fungus appears to be involved.

Peters, D. S., and V. P. Lewis.

1984. Estuarine productivity: Relating trophic ecology to fisheries.

In B. J. Copeland, K. Hart, N. Davis and S. Friday, eds. Research managing the nation's estuaries. University of North Carolina Sea Grant College, Publication UNC-SG-84-08, p. 255-264.

The quantity and environmental quality of shallow habitats are being degraded by coastal development.

Peters, D. S., and W. E. Schaaf.

1981. Food requirements and sources for juvenile Atlantic menhaden.

Transactions of the American Fisheries Society 110:317-324.

Objectives were to produce a preliminary estimate of the food required by the population of juveniles.

Powell, A. B., and G. Phonlor.

1986. Early life history of Atlantic menhaden, Brevoortia tyrannus, and gulf menhaden, B. patronus.

U.S. National Marine Fisheries Service, Fishery Bulletin 84:991-995.

Life history aspects of Atlantic and gulf menhaden such as distribution, age, size and spawning are described.

Powers, J. E.

1983. Report of the Southeast Fisheries Center Stock Assessment Workshop.

NOAA Technical Memorandum NMFS-SEFC-127.

The emphasis of the workshop was on the biological status of the stock and the effects of fishing effort and mortality. Includes summary stock assessment of Atlantic and gulf menhaden.

Reintjes, J. W.

1964. Annotated bibliography on biology of menhadens and menhaden-like fishes of the world.

U.S. Fish and Wildlife Service, Fishery Bulletin 63:531-549.

Bibliography of Brevoortia, Ethmalosa and Ethmidium with major references to 1957 and all references 1958-62.

Reintjes, J. W., J. Y. Christmas, Jr., and R. A. Collins.

1960. Annotated bibliography on the biology of American menhaden.

U.S. Fish and Wildlife Service, Fishery Bulletin 60:297-322.

A review of the literature on the distribution, occurrence, abundance, life history, morphology, ecology and behavior of menhaden, genus Brevoortia, published prior to and during 1957.

Reintjes, J. W., and P. M. Keney.

1975. Annotated bibliography on the biology of the menhadens, genus Brevoortia, 1963-1973.

NOAA Technical Report NMFS-SSRF-687. 92 p.

Annotated bibliography of menhaden Brevoortia species.

Reish, R. L., R. B. Deriso, D. Ruppert, and R. J. Carroll.

1985. An investigation of the population dynamics of Atlantic menhaden (Brevoortia tyrannus).

Canadian Journal of Fisheries and Aquatic Sciences 42:147-157.

The biological components investigated were growth, natural mortality, migration, fishing mortality and recruitment.

Richardson, L. B., and D. T. Burton.

1981. Toxicity of ozonated estuarine water to juvenile blue crabs (Callinectes sapidus) and juvenile Atlantic menhaden, (Brevoortia tyrannus).

Bulletin of Environmental Contamination and Toxicology. 26: 171-178.

Crabs were exposed to ozone produced oxidant (OPO: as total residual chlorine), response surface model values derived. Menhaden values had to be extrapolated.

Roberts, M. H., Jr., and D. J. Fisher.

1985. Uptake and clearance rates for Kepone in two marine fish species.

Archives of Environmental Contamination and Toxicology 14: 1-6.

The concentration of Kepone (Chlordecone) causing 50% mortality of a test population (96hr LC50) was 17.4µg/l for Brevoortia tyrannus (Atlantic menhaden) and 28.8µg/l for Menidia menidia (Atlantic silverside).

Rogers, G. S., and M. J. Van Den Avyle.

1983. Atlantic menhaden.

U.S. Fish and Wildlife Service, FWS/OBS-82/11.11. 20 p.

A brief comprehensive sketch of the biological characteristics and environmental requirements of the species.

Rozas, L. P., and C. T. Hackney.

1984. Use of oligohaline marshes by fish and macrofaunal crustaceans in North Carolina.

Estuaries 7:213-224.

The most abundant species were spot, grass shrimp, bay anchovy and Atlantic menhaden.

Rulifson, R. A., and J. E. Cooper.

1986. A method to determine mesh-size selectivity in commercial menhaden purse seines.

North American Journal of Fisheries Management 6:359-366.

A field method was developed for examining the influence of purse-seine mesh size and mesh construction on size of Atlantic menhaden (Brevoortia tyrannus) captured by commercial menhaden fishermen.

Ruppert, D., R. L. Reish, R. B. Deriso, and R. J. Carroll.

1984. Optimization using stochastic approximation and Monte Carlo simulation (with application to harvesting of Atlantic menhaden).

Biometrics 40:535-545.

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