



AMERICAN FISHERIES SOCIETY

JULY 1996

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PRESIDENT'S MESSAGE:

The usual story with volunteer organizations is "Can you serve on this committee?" or "Can you help with this project?" And there is plenty of opportunity for that kind of volunteer effort within the NC Chapter. But it is not always a one-way street - sometimes the Chapter directly serves its member rather than the reverse. Continuing education courses are the example I have in mind. They can be a good way to enhance our abilities as fisheries professionals. One of my goals for my term as Chapter President is to assist in putting on a continuing education course. It looks as though two courses will be available - an NCSU course on Aquatic Weeds that the Chapter will co-sponsor, and a GIS course that we hope to present just before the annual meeting. The GIS course will be our first real attempt to put on a workshop. The topic is timely and the course will be geared toward practical fisheries applications. I encourage you to attend, and hope that a successful first course will start a tradition of annual short courses that meet the needs and interests of our members. We are making progress on our plans for the 1997 meeting, which will be held February 11-13 at Camp Thunderbird near Charlotte, NC. This joint meeting with the SC AFS Chapter and SC Fisheries Workers Association should be a great opportunity to make contacts and learn new solutions to shared problems.

- Joe Hightower

MANAGEMENT OF ATLANTIC COAST MARINE FISH HABITAT A WORKSHOP FOR HABITAT MANAGERS

Fisheries and management of marine fish habitat are inherently intertwined. Fish habitat is synonymous with everything a fish needs to survive; thus habitat management decisions can severely impact the resources upon which fish depend. It is critical that fishery managers and habitat managers work together to manage these vital resources. The Atlantic States Marine Fisheries Commission is sponsoring a three day workshop to provide an opportunity for habitat and fishery managers to collaboratively work to improve fish habitat protection. Co-sponsored by the National Oceanic and Atmospheric Administration's Coastal Services Center, the National Marine Fisheries Service and the U.S. Fish and Wildlife Service, the workshop will facilitate communication between habitat and fishery managers, as well as heighten the consideration of impacts to fisheries during habitat management deliberations. This will be accomplished by informative presentations and discussions on current topics, such as identification of essential fish habitat, the effects of pollution and habitat degradation on fisheries, innovative approaches to fish habitat management, and more. The workshop will be held in Philadelphia, Pennsylvania at the Ramada Inn - Philadelphia International Airport (phone 610/521-9600), on June 3-6, 1996. The workshop had originally been scheduled for March, but was postponed because of the federal budget crisis. Pre-registration is required because of limited seating availability. For further information, call 202/289-6400, or e-mail at 74107.2632@compuserve.com.

**MINUTES OF THE 1996 ANNUAL BUSINESS MEETING,
NORTH CAROLINA CHAPTER OF THE AMERICAN FISHERIES SOCIETY,
NC FFA CENTER, WHITE LAKE, NORTH CAROLINA, JANUARY 17, 1996**

President-Elect Joe Hightower called the meeting to order at 11:10 a.m. President Don Degan could not preside over the meeting due to other obligations. It was determined the membership present did not constitute a quorum. Larry Olmstead made a motion to suspend the rules. The motion was seconded by Jim Rice, and passed unanimously.

SECRETARY-TREASURER'S REPORT: The minutes of the 1995 Annual Business Meeting were published in the April 1995 newsletter. Joe Hightower proposed the minutes be accepted as printed. Dick Stroud made a motion to accept the minutes as printed. The motion was seconded and passed. Shari Bryant read the treasurer's report. The report is attached.

COMMITTEE REPORTS:

Education Committee: Bob Curry reported the Education Committee met on November 9, 1995. The charges of the Committee as outlined in the Long Range Plan were discussed. The Committee decided to concentrate its efforts on one or two issues and felt a student representative and extension specialist needed to be added to the Committee membership. The Committee established the following objectives for 1996: 1). Sponsor a continuing education workshop, outside of the annual meeting, 2). Provide a demonstration of new technologies in conjunction with the annual meeting, 3). Develop a Chapter display to recruit new members and publicize the organization, and 4). Sponsor a youth fishing clinic during National Fishing Week. This last objective could be a project for the Student Subsection.

Local Arrangements Committee: Joe Hightower reported 56 persons attended this year's meeting. Keith Ashley was recognized for his work on the Committee.

Program Committee: Joe Hightower thanked Mike Street, Mike Meador and Stephanie Goudreau for their help in organizing this year's program. He also thanked the people who presented papers. Finally, he recognized Stephanie Goudreau, Hugh Barwick and Gerald Pottern who served as judges for this year's Best Student Paper Award.

Newsletter Committee: Bob Goldstein reported that there were 4 newsletters published during 1995 and acknowledged the production work done by Shari Gunter. The membership thanked Bob for his fine work in publishing the newsletter.

Nominating Committee: Scott Van Horn reported that the candidates for President-Elect were Bob Goldstein and Hugh Barwick; and the candidates for Secretary-Treasurer were Chad Thomas and Dave Cathey. The elections for both offices were close. President-Elect for 1996 is Hugh Barwick and the new Secretary-Treasurer is Chad Thomas.

Environmental Concerns Committee (ECC): Chair Roger Bryan reported on the activities of the Environmental Concerns Committee in 1995. In March, President Don Degan submitted comments on the proposed rule modifications to Wetlands and 401 Certification Procedures. The comments, submitted to Ron Ferrell of NC Division of Environmental Management, stated that we support conservation of wetlands and wetland communities and reiterated the need for improved cooperation with state, federal and private agencies with expertise in aquatic resources. In June, Past-President Wilson Laney submitted a position statement from the Chapter Executive Committee and Environmental Concerns Committee on House Bill 832 addressing

critical habitat. The statement, presented to the NC Senate Agriculture and Environment Committee, expressed opposition to the Bill because it limited application of critical habitat definitions to Federally designated species. The provision would have effectively eliminated the State's right to protect species of State concern. The statement was a reinforcement of letters dated February 1994 and September 1994 on the revised definition of critical habitat. A proposal to raise trout in net pens for commercial purposes within Fontana, Hiwassee and Apalachia lakes was submitted to US Army Corps of Engineers and Tennessee Valley Authority (TVA) by Carolina Trout Company in Andrews. TVA denied the proposal. Unless the proposal is resubmitted, no further action will be taken by the ECC. Rich Noble commented that the statement about NC State University supporting the net pen trout project was not accurate. He stated an individual with the University reviewed the project and the comments could have been interpreted as endorsing it, but NC State University did not issue a statement endorsing the project. Roger stated that the ECC is interested in hearing about issues of concern around the state. He asked that members forward the information to him at P.O. Box 241 Whittier, NC 28789.

Student Subsection: Lynn Waller reported the raffle raised approximately \$200.00 for the student subsection.

OLD BUSINESS:

Strategic Plan: Joe Hightower reported that the Education Committee, chaired by Bob Curry, was now formed. It was suggested to postpone establishing a Budget and Finance Committee until the Chapter had more money in the treasury.

NEW BUSINESS:

Outstanding Achievement Award: Rich Noble recognized Larry Olmstead who received the Outstanding Achievement Award. Larry received this award because of his contributions to the Society, profession and attention to good science by utility companies.

AFS 2000: Roger Bryan provided the Chapter with information on AFS 2000. AFS 2000 is a project to raise funds to support publication endowment, upgrade the AFS computer system and retire the mortgage on the AFS headquarters. Each member and Chapter are being asked to contribute. Joe Hightower opened the subject for discussion. Several members supported the idea of the Chapter making a contribution. Joe suggested the Chapter contribute \$200.00 to AFS 2000. The Chapter voted unanimously to contribute \$200.00.

SC Chapter: Bob Goldstein suggested that the Chapter donate funds to the SC Chapter student subsection. These funds could be used to support student travel to professional meetings. In 1987, the SC Chapter sold T-shirts at the National Meeting and approximately \$200.00 of the profits were donated to NC to help form the NC Chapter. This donation would repay the SC Chapter for its contribution. Some members thought that the Chapter might already have made a donation to the SC Chapter. A motion was made to donate \$200.00 to the SC Chapter if it has not already been done. The motion was seconded and it passed unanimously.

1997 Annual Meeting: The 1997 meeting is scheduled to be a joint meeting between the NC Chapter and the SC Chapter. The meeting will be held near Charlotte. Joe Hightower asked members to make suggestions to the Executive Committee regarding topics to be presented at the 1997 meeting.

INSTALLATION OF NEW OFFICERS: Nominating Committee Chair Scott Van Horn installed the new officers for 1996. President - Joe Hightower, President-Elect - Hugh Barwick, Secretary-Treasurer - Chad Thomas and Past-President - Don Degan.

BEST STUDENT PAPER AWARD: Braden McCollum (N.C. State University) won this year's award. Braden's presentation was titled The role of habitat complexity in mediating predator/prey interactions: experimental tests of eelgrass (*Zostera marina*) as a refuge from piscivory. He received a plaque, a one year student membership to AFS and a one year subscription to the journal of his choice.

The meeting was adjourned at 11:45 a.m.

Submitted by: Shari L. Bryant, Secretary-Treasurer

NCAFS TREASURER'S REPORT, JANUARY 17, 1996

Beginning Balance (1/1/95)	\$1,817.00
<i>Income</i>	
Annual Meeting (1995)	\$1,813.75
AFS Chapter Dues	693.00
AFS Rebate	68.00
Total Income	\$2,574.75
<i>Expenses</i>	
Annual Meeting (1995)	\$1,671.25
Newsletter	513.33
Tennessee Chapter Donation	100.00
Plaques (1994 and 1995)	63.50
Total Expenses	\$2,348.08
Ending Balance (1/17/96)	\$2,043.67

Submitted by: Shari L. Bryant,
Secretary-Treasurer

INTEGRATED AQUATIC WEED MANAGEMENT

A short course on Integrated Aquatic Weed Management will be given at the NCSU McKimmon Center on September 9-10, 1996 (Monday-Tuesday). Experts from throughout the U.S. will speak on all aspects of aquatic weed management, including pond design and construction, factors affecting weed growth, aquatic plant identification, fertilization and pond dyes, water level manipulation, benthic barriers, mechanical control, biological control (insects, grass carp, etc.), and pesticides and herbicides.

The early registration fee will depend on the level of sponsorship obtained, but is expected to be about \$60-\$75 per person. Late registration (after August 12) will be \$90/person. The course was well-received when last held in 1991.

ATLANTIC ISLANDS, OFFSHORE OIL AND DEVELOPMENT

Planning continues for an international conference on 'Atlantic Islands, Offshore Oil and Development,' to be held in St. John's, Newfoundland, in September 1997. It will be a component of the 'Summit of the Sea,' part of the celebrations of the 500th anniversary of John Cabot's discovery of (probably) Newfoundland. The conference will provide an opportunity for participants from Newfoundland, Trinidad, the Shetlands, Orkneys, Faroes, Falklands and other Atlantic islands, and academics, consultants, government officials and business-people with related interests, to discuss the impacts of the offshore oil industry and their management.

We are in the process of identifying potential speakers and would be interested in receiving suggestions, expressions of interest and proposals. Conference themes include Regulatory Approaches, Fiscal Management, Environmental Planning and Management, Economic Benefits Planning, Impacts on Traditional Industries, Cultural and Social Impacts. While focusing on Atlantic islands, presentations related to experiences in other parts of the world would be of interest. Respond to Mark Shrimpton, Community Resource Services Ltd., P.O. Box 5936, St. John's, Newfoundland, Canada, A1C 5X4.

ABSTRACTS FROM THE 1996 NCAFS CHAPTER MEETING

Spring electrofishing surveys of reservoir fish populations by *Hugh Barwick, Duke Power Company*

Estimates of taxa composition and fish abundance were obtained from 11 Catawba river reservoirs in 1993-1995 using a boat-mounted electrofisher. Shoreline electrofishing was generally conducted along ten 300-m transects in spring when water temperatures ranged from 15 C to 20 C. All stunned fish were collected and sorted by taxon. Total number and total weight of each taxon were obtained. Taxa composition and abundance varied greatly among these reservoirs. The number of taxa collected ranged from 19 in Lake Rhodhiss to 32 in Lake Wylie. Overall, 56 taxa were collected from the Catawba River reservoirs. Mean fish abundance range from 89 kg/3000 m to 452 kg/ 3000 m of sampled shoreline. Regression analyses indicated that the observed variations in fish biomass among the Catawba river reservoirs may be related to total phosphorus concentrations in these reservoirs.

The effects of a tertiary-treated sewage effluent on growth and mortality rates in the tellinid clam *Macoma mitchelli* in the Neuse River estuary, North Carolina by *Lynn M. Waller, North Carolina State University*

In November of 1994, the Marine Corps Air Station at Cherry Point in Havelock, North Carolina began diverting tertiary-treated sewage waste water from release in Slocum Creek to an effluent diffuser site in the lower Neuse River. To examine the potential impact of the 13.25 million liters/day effluent on this important recreational and commercial fisheries area, we used the small soft-shelled clam *Macoma mitchelli* as a biological indicator. *M. mitchelli* was selected because it is the prevalent bivalve in this system and the primary food source for the blue crab (*Callinectes sapidus*). Beginning in June of 1994, we placed cages of *M. mitchelli* at varying distances and directions from

the diffuser and determined growth and survival during one-month intervals. Our objectives were to: 1) compare growth and survival rates before and after the release of the effluent, 2) examine changes in growth and survival rates as a function of distance and direction from the effluent, and 3) determine factors which affect growth and survival rates. Seasonal patterns of survival were similar in both 1994 and 1995 with rates falling to near zero in June and July. Survival varied seasonally and was correlated with dissolved oxygen and temperature levels. We did not detect any effect of the effluent on survival rates. Likewise, we saw no evidence of an effluent effect on growth, although growth rates were higher in 1995 than in 1994. Growth rates varied seasonally and were inversely related to initial size.

Trophic dynamics of juvenile largemouth bass (*Micropterus salmoides*) in two tropical reservoirs by *Alexis R. Alicea, NC State University*

The feeding dynamics of juvenile largemouth bass were studied from March 1992, to December 1994. A total of 1272 stomachs from Lucchetti Reservoir and 389 from Guajataca Reservoir were analyzed. A high percent of identifiable fish prey in the stomachs of juvenile bass was obtained. Early piscivory by juvenile bass was observed in Lucchetti Reservoir, aided by constant availability of fish prey items (threadfin shad, tilapias and bluegills). *Threadfin shad seems to be the primary food item for juvenile bass in both reservoirs.* Fish diet is supplemented with bluegills and tilapias during periods of relative high abundance. A direct relationship between predator size to prey size was observed. Insectivory was high in situations of low fish prey abundance and was a reflection of the percent of empty stomachs. Juvenile bass from Guajataca Reservoir experienced periods of low prey availability, on which high insectivory was observed along with high percent of empty stomachs and cannibalism. The distinction of two sub-cohorts in Lucchetti Reservoir showed different feeding preferences among them. Different from what expected, insect consumption by early-hatched bass in Lucchetti Reservoir was constantly higher

than for late-hatched bass. Piscivory was lower for early-hatched bass than for late-hatched bass. Regardless of sub-cohort an increasing predator-prey size relationship was observed. Despite the artificial predator-prey community comprised of exotics, juvenile largemouth bass generally experienced adequate food supplies. Supplemental stocking of juvenile largemouth bass may be desirable in some situations to utilize abundant prey.

ECU's Field Station for Coastal Studies at Mattamuskeet: Off-Campus Opportunities for Research and Environmental Education by Roger A. Rulifson, East Carolina University

The Albemarle-Pamlico peninsula in eastern North Carolina contains over one million acres of natural areas protected under federal and state programs. In 1994, ECU, in partnership with the U.S. Fish and Wildlife Service, established a field station at the Mattamuskeet National Wildlife Refuge. The Field Station is housed in the stately Mattamuskeet hunting lodge, a national landmark constructed in 1914-15 as the world's largest pumping station to drain Mattamuskeet Lake for farming. In 1937, the pumphouse was converted by the CCC into a world-famous hunting lodge. We envision a unique broad-based academic program at the facility involving research in areas of wetland ecology, archaeology, colonial and maritime history, geography, and anthropology.

The role of habitat complexity in mediating predator/prey interactions: experimental tests of eelgrass (*Zostera marina*) as a refuge from piscivory by Braden R. McCollum, NC State University

Marine seagrasses provide an almost ideal model system in which to test the functional value of structural complexity. With this in mind, I performed an outdoor laboratory experiment to examine two main questions. First, does dense seagrass affect the foraging efficiency of two different kinds of piscivores: an active predator,

bluefish (*Pomatomus saltatrix*) and an ambush predator, southern flounder (*Paralichthys lethostigma*), feeding on juvenile spot (*Leiostomus xanthurus*)? Within this first question, I also explored whether structure affects ambush and active predators differently. Second, if the foraging efficiency of active and/or ambush predators is affected by dense seagrass, what component of this structure causes the effect(s)? i.e., the physical barrier of the blades or the visual barrier. In addition to these initial feeding trials, I also performed a series of videotaped behavioral trials to determine if habitat complexity affected the behavior of either predator.

Status of selected Cape Fear River Basin endangered aquatic species by John M. Alderman, Nongame & Endangered Wildlife Program NC Wildlife Resources Commission

The Cape Fear shiner (*Notropis mekistocholas*) is a federally listed endangered species endemic to the Cape Fear River Basin. Extant populations exist in the Deep River from Coleridge in Randolph County to above US 1. Two isolated populations also exist in the Haw River, one above the reservoir at Bynum and one below the reservoir. Most extant populations should be considered viable under present conditions. No extant populations have been found recently in the Cape Fear River below the Haw/Deep river confluence. Rare mussels found in the Cape Fear River Basin include the squawfoot (*Strophitus undulatus*), brook floater (*Alasmidonta varicosa*), Roanoke slabshell (*Elliptio roanokensis*), triangle floater (*Alasmidonta undulata*), Atlantic pigtoe (*Fusconaia masoni*), yellow lampmussel (*Lampsilis cariosa*), pod lance (*Elliptio folliculata*), eastern lampmussel (*Lampsilis radiata*), eastern pondmussel (*Ligumia nasuta*), and Savannah lilliput (*Toxolasma pullus*). Most of these species are state listed threatened and are species of concern for the federal government. Areas with significant populations include the Deep River, Rocky River, Cape Fear River above Fayetteville, the Black River, Town Creek, and Rices Creek.

**The Roanoke River Fish Kills by James W. Kornegay and T. Wayne Jones,
NC Wildlife Resources Commission**

Two extensive fish kills occurred in Roanoke River between 25 July and 2 August 1995. Moribund fish were initially observed in the bypassed reach of the river below Roanoke Rapids Lake dam and later in the river between Norfleet and Jamesville. Mortality of an estimated 2,350 striped bass (*Morone saxatilis*) occurred directly below the dam after spillway gates were closed on 24 July leaving fish stranded in isolated pools where water temperature increased rapidly. A second fish kill began after water release rates from Roanoke Rapids Lake dam were rapidly curtailed on July 29, causing waters which had inundated thousands of acres of wetlands adjacent Roanoke River, and which had become anoxic, to empty into Roanoke River. This fish kill occurred over approximately 76 river miles and killed an estimated 7,000 striped bass as well as approximately 16,000 fish of other species. Dissolved oxygen levels in the kill area ranged from 0.4 to 2.0 mg/l. The total value for dead striped bass and lost recreational fishing opportunities associated with these dead fish is estimated at \$412,839.

The North Carolina Commercial Fishing License Moratorium - An Opportunity for Major Change. (CANCELLED) by Michael W. Street, NC Division of Marine Fisheries

Based on increased conflicts, declining resources, declining catches, increasing conflict, and increasing media attention, the North Carolina General Assembly enacted a moratorium on the sale of new commercial fishing licenses, effective 1 July 1994. A high level committee was appointed to thoroughly evaluate the existing coastal fisheries management system and recommend changes in licensing, define users, consider management policies and plans, and examine any other relevant issue. Funds were allocated to the North Carolina Sea Grant College Program to support needed

research. The Fisheries Moratorium Steering Committee and its five subcommittees (license, enforcement, gear, organization, habitat) have been meeting monthly to debate the issues and develop recommendations. Preliminary recommendations address the size, composition, and authority of the Marine Fisheries Commission; license categories; limited entry; enforcement jurisdiction; and many other topics. The Moratorium Study presents a unique opportunity to address coastal fisheries management issues in a comprehensive manner.

Fish community sampling in the Albemarle-Pamlico drainage of North Carolina and Virginia as part of the U.S. Geological Survey's water-quality assessment program by Peter M. Ruhl, U.S. Geological Survey

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is designed to describe the status of and trends in the quality of a large, representative part of the Nation's surface- and ground-water resources and to provide a sound, scientific understanding of the primary natural and human factors affecting the quality of these resources. The Albemarle-Pamlico drainage of North Carolina and Virginia is one of 60 NAWQA study basins nationwide and one of the first 20 basins where a 3-year, intensive data-collection phase was begun in 1992. Fish community samples were collected by electrofishing in 1993 and 1995 at 23 sites on streams and rivers in the Albemarle-Pamlico drainage. Fish were collected by boat electroshocker at 6 sites and by using an electric seine at 17 sites. All but one of the sites are located in the Coastal Plain. Water-chemistry and habitat data also were collected at these sites. The study is ongoing and data analyses have not been completed. Fish community data are being analyzed to explore relations among fish community structure and land use, habitat, and water chemistry in and around Coastal Plain streams. Data from multiple-reach and extended-reach sampling at five sites will be used to

explore interreplicate variability. The results of this study will contribute to a greater understanding of the organization of fish communities in Coastal Plain streams and how these communities can be used to assess water quality.

North Carolina Rivers Assessment by Steven E. Reed, NC Division of Water Resources

The North Carolina Rivers Assessment (NCRA) is just beginning. It is a three year effort to evaluate a number of the most important characteristics of major North Carolina rivers and streams. The characteristics or river values to be studied are being determined from input received at public workshops across the state. Technical work teams composed of people with expertise in specific areas will develop criteria for individual river values. River reaches will be assessed by team members, agencies, and the public based on the criteria established for each river value. The information produced by the NCRA will be used to develop a GIS (Geographic Information System) data base. This data base will be available through the Internet to provide access to all users. The North Carolina Department of Environment, Health, and Natural Resources has been designated by Governor James B. Hunt, Jr. as the lead state agency to coordinate the NCRA. A coalition of all groups including: municipalities, utilities, agricultural interests, conservation groups, agencies, industries, and recreationalists will be needed to complete the Assessment. A status report on the progress of the NCRA will be provided.

Selected population characteristics of redbreast sunfish in the Black and Lumber rivers, North Carolina by Keith W. Ashley, NC Wildlife Resources Commission

The objective of this study was to evaluate a 12-fish daily creel limit on redbreast sunfish by comparing changes in abundance, length frequency distributions, age and growth, and PSD and

RSD20cm over a 4 year period. Utilizing standard boat mounted electrofishing gear, a total of 123 redbreast sunfish were collected from the Black River during 1994 while 122 were collected during 1995. A total of 257 redbreast sunfish were collected from the Lumber River during 1994 while 252 were collected during 1995. Redbreast sunfish accounted for 20% by number and 5% by weight of the Black River centrarchid population collected during 1994 and 17% by number and 7% by weight during 1995. Lumber River redbreast sunfish accounted for 41% by number and 32% by weight of the centrarchid population collected during 1994 and 35% by number and 36% by weight during 1995. Black River redbreast sunfish had a mean CPUE of 18 fish/hour during 1994 and 19 fish/hour during 1995, while Lumber River redbreast sunfish were captured at a rate of 35 fish/hour during 1994 and 33 fish/hour during 1995. PSD values for redbreast sunfish in the Black River exceeded 30 both years of the study while PSD values exceeded 45 for Lumber River redbreast. Based on these values, the redbreast sunfish populations in both systems would be categorized as high quality fisheries. RSD20cm values for Lumber River redbreast of 13 (1994) and 28 (1995) would suggest an exceptional redbreast fishery in this system.

Management of American shad in southeastern North Carolina by Fred C. Rohde, NC Division of Marine Fisheries

American shad stocks are characterized as either stressed or depressed along the Atlantic coast. Landings in North Carolina have fallen from 950,000 lbs in 1970 to a record low of 110,986 lbs in 1994. In response the North Carolina Division of Marine Fisheries established a season from January 2 to April 14, effective in 1995, for the taking of shad and river herrings. This rule led to conflicts with fishermen and with the Wildlife Resources Commission. Other management options being considered are net lift days, bag limits, no fishing zones, and quotas. Also more effective methods of passing fish through the locks on the Cape Fear River are being explored.

Habitat use and movements of anadromous fishes in the lower Cape Fear River by Mary L. Moser and Steve W. Ross, Center for Marine Science Research

We conducted a fishery-independent gillnet survey and sonic tracking study from May 1990 - September 1992 to establish the distribution and movement patterns of shortnose sturgeon *Acipenser brevirostrum* and other anadromous fishes in the Cape Fear system. In spite of intensive gillnet sampling (893 net days), only seven shortnose sturgeon were captured. Three of seven fish we tagged were recaptured, further indicating that shortnose sturgeon are very rare in this drainage. We also documented high fishing pressure on other anadromous species: juvenile Atlantic sturgeon, *A. oxyrinchus*; adult striped bass, *Morone saxatilis*; adult American shad, *Alosa sapidissima*. Atlantic sturgeon juveniles occupied deep holes (> 10 m) in the upper estuary in summer and moved to the lower estuary and nearshore ocean in fall and winter. From December-April, striped bass stayed in very small territories in shallow, shoreline habitat located in the estuary. In April they initiated upstream migrations. Tag returns and tracking data indicated that some striped bass negotiated Lock and Dam #1 during spawning migrations. In contrast, American shad and shortnose sturgeon migrations were interrupted by capture in gillnets and blocked by Lock and Dam #1. The N.C. Division of Marine Fisheries has banned all sturgeon fishing in the state and has placed a season on shad fishing at Lock and Dam #1. Further study is needed to determine how locking procedures can be modified to enhance upstream passage of anadromous species.

Basinwide biological monitoring by NCDEM, with special emphasis on the Cape Fear River Basin by Trish Finn MacPherson, NC Division of Environmental Management

NCDEM collects benthic macroinvertebrates and fish community samples throughout North Carolina in order to assign water quality ratings to wadeable streams and rivers. The collections are now being made on a five year basin rotation schedule, in which each of the 17 river basins is sampled once every five years. Emphasis is placed on mainstream river sites, large tributaries, unassessed areas, problem areas and potential High Quality Waters areas. The Cape Fear River basin was sampled in 1993, when 96 benthos samples were collected. A total of 295 benthos sites have been sampled from 1983 through 1993. A total of 47 fish community structure analysis sites have been evaluated in the basin. A brief review of benthos and fish sampling methodologies and analysis metrics will be given. A comparison of fish and benthos data will be made, where possible, and overall water quality assessments will be presented.

Investigation of atmospheric mercury deposition in eastern North Carolina: an emerging source of mercury in the piscivorous fish by Mark T. Hale, NC Division of Environmental Management

NCDEM fish tissue surveys conducted in eastern North Carolina have revealed a pattern of mercury contamination in piscivorous fish comparable across multiple drainage basins, often in areas far removed from human activity. Data from these surveys suggest that atmospheric mobilization and deposition of mercury may contribute substantially to burdens in aquatic ecosystems throughout the Coastal Plain. The role of atmospheric mercury deposition is currently being assessed by the DEM Air Quality Lab in conjunction with Water Quality Section fish studies. Atmospheric investigations may prove to be a new tool in DEM efforts to better understand routes of mercury contamination in the state's aquatic ecosystems.

A retrospective natural history of the lower Cape Fear River by William F. Adams, U.S. Army Corps of Engineers

The first European colonists encountered a Cape Fear River which was strikingly different from the one we know and manage today. Water depths, substrates, salinity, snag density and many other physical and chemical variables have been altered by two centuries of navigation improvements and economic development. When combined with intensive resource exploitation by an ever-expanding human population during this period, many commercially valuable and ecologically important aquatic species suffered extraordinary population declines. Without a clear understanding of the historic productivity and diversity of the river, we manage surrounded by a clouded horizon, with no clear perspective of where we could, or should, be directing our efforts to reacquire its full biotic potential. This retrospective natural history of the Lower Cape Fear River synthesizes many different sources of information; accounts of explorers, folk histories, old newspaper clippings, journal articles, and engineering reports on river conditions to provide a window on the river life of the past.

Small hydropower project development in the Cape Fear River basin by Steven E. Reed, NC Division of Water Resources

Since the early 1980's the majority of the old hydro electric projects in the basin have been retro-fitted and are once again producing electricity. There are ten projects on the Deep River and four small hydros on the Haw River. Prior to going back into operation each project went through the licensing process of the Federal Energy Regulatory Commission (FERC). State and Federal agencies provided comments during the licensing process to minimize environmental impacts. Major environmental concerns include run-of-river operation rather than peak power production. Provision of adequate minimum flow in the by-pass reach between the dam and powerhouse is also a concern. Measures to prevent entrainment and impingement of fishes have typically been part of

the agencies' recommendations. Compliance monitoring is an important part of project operations and is primarily the responsibility of the licensee and the FERC. State and Federal agencies have frequently brought problems dealing with minimum flow and run-of-river operations to the attention of FERC and the hydro operators.

NATIONAL FISHING WEEK EVENTS FOCUS ON REELING IN YOUNG ANGLERS

More than 50 million Americans enjoy fishing. To celebrate this pastime (second only to swimming) thousands of events will be held nationwide during National Fishing Week June 3-9, 1996, including a kickoff in Washington, DC. Special events are aimed at introducing children to conservation and the environment. The National Fishing Week kickoff will be held June 3 at Constitution Gardens on the Mall in Washington, DC, sponsored by the National Fishing Week Steering Committee, a non-profit coalition with membership from Federal and state agencies, conservation groups, and the fishing industry. Agencies hosting the kickoff are the U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, U.S. Forest Service, and the DC Department of Fisheries. Guest Services, Inc., a major food, lodging, and leisure services company headquartered in Fairfax, Virginia, will donate lunches for the children. Berkley, Inc., a fishing tackle manufacturer and member of the National Fishing Week Steering Committee, will provide beverages, rods and reels, and hats. Jands, Inc. and Remington's Stren Fishing Lines have donated other souvenirs for the children. During the kickoff, representatives from the agencies, local conservation groups, and the fishing industry will use a popular education program called Pathway to Fishing to introduce the youngsters to the world of fishes and the sport of fishing. Pathway to Fishing consists of 12 instructional stations at which participants learn different aspects of fishing, such as fish identification, angling ethics, and knot-tying and casting techniques. Pathway to Fishing is available for \$61 from the Government Printing

Office, stock number 024-010-00697-8, phone 202-783-3238. As part of National Fishing Week, Federal agencies will unveil a just-completed National Recreational Fishery Resources Conservation Plan outlining strategies Federal agencies will pursue to improve recreational fishing. The plan's goal is to boost recreational fishing opportunities nationwide through conservation, restoration, and enhancement of aquatic systems and fish populations and by increasing fishing access, education and outreach, and partnership opportunities. Development of the National Recreational Fishery Resources Conservation Plan was required by an Executive Order on Recreational Fisheries signed by President Clinton during National Fishing Week last year. The plan has been signed by the Secretaries of the Departments of Agriculture, Commerce, Defense, Energy, Interior, and Transportation, as well as the Administrator of the Environmental Protection Agency. As part of the plan, each department has pledged to improve recreational fisheries within the context of its programs and responsibilities. In addition, the Fish and Wildlife Service and the National Marine Fisheries Service will announce their final policy on improving administration of the Endangered Species Act as it relates to recreational fisheries. The policy, also a requirement of last year's Executive Order, is aimed at avoiding or resolving conflicts between endangered species conservation and recreational fishing. Begun more than a decade ago, National Fishing Week starts the first Monday in June and continues through the following Sunday.

FISHING TACKLE LOANER PROGRAM

On April 27, 1996, members of the North Carolina Chapter participated in the initiation of a Fishing Tackle Loaner Program at Shelley Lake in Raleigh. The Program was established by the North Carolina Wildlife Resources Commission (WRC), working cooperatively with the Sport Fishing Promotion Council, the marketing arm of the American Sportfishing Association, and the Raleigh Parks and Recreation Department. Four loaner sites

were established at the following locations: Shelley Lake, Lake Wheeler, Lake Johnson and Lake Benson. The purpose of the Program is to introduce new anglers, particularly children, to fishing and to provide opportunities for novice anglers to improve their skills. Participants are issued a card which functions like a library card. Rods and reels can be checked out for up to 7 days. First time participants are given a small tackle box filled with terminal tackle that they keep. At the April 27 kickoff, 65 children ages 7 to 16 and seven adults participated. Additional volunteers included personnel from the Raleigh Parks and Recreation Department, members of the Raleigh Sertoma Club and students from the NCSU Aldo Leopold Club.

A second fishing clinic is planned for June 8, 1996 at Shelley Lake to celebrate National Fishing Week. This program is jointly sponsored by the WRC and NC Chapter of AFS. All participants will also be registered in the Fishing Tackle Loaner program and each participant will be given a fishing tackle box to keep. The program will begin at 9:00 am and end at 1:00 pm. Volunteers are still needed! Contact Bob Curry at 733-3633 for details.

ARCVIEW® WORKSHOP

The NCAFS Chapter and Duke Power Company are joint sponsors of a continuing education workshop on the use of ArcView® (a GIS program) for fisheries applications. Certified ArcView® instructor Tim Leonard has taught a similar course to Duke Power biologists. The workshop will be held at a Duke Power training Center at Lake Norman all day on Monday, February 10 and the morning of Tuesday, February 11. The location can accommodate 15 people, and each person will have a computer for hands-on use. If there is sufficient demand, the course will be offered again on the afternoon of February 13 and all day February 14.

The cost of the workshop will be \$40 per person. Contact Bob Curry of the WRC at 733-3633 or email address is curryrl@mail.wildlife.state.nc.us to register.

MEMBERSHIP APPLICATION

APPLICANT INFORMATION (mail materials to ☐ personal or ☐ employer address)

Name: Last	First	Initial	Please provide phone numbers for directory and Society use only:	Name of Employer
Address			Home ()	Address
City	State/Province	Zip/Postal Zone	Work ()	City
			Fax ()	State/Province
Country	Membership year*	Employed by ☐ federal gov't. ☐ state/prov. gov't.		Zip/Postal Zone
		☐ industry, ☐ academia, or ☐ self		Country

MEMBERSHIP DUES (includes *Fisheries* and Membership Directory)

- ☐ Regular \$66.50 (outside USA \$70.50)
- ☐ Student \$33.25 (outside USA \$37.25)**
- ☐ Retired (age 65 or over) \$33.25 (outside USA \$37.25)***

JOURNAL SUBSCRIPTIONS (Optional)

- ☐ *Transactions of the American Fisheries Society* (bimonthly) \$30 (outside USA \$35)†
- ☐ *North American Journal of Fisheries Management* (quarterly) \$30 (outside USA \$35)†
- ☐ *The Progressive Fish-Culturist* (quarterly) \$25 (outside USA \$28)††
- ☐ *Journal of Aquatic Animal Health* (quarterly) \$25 (outside USA \$28)†

† Prices for AFS members only. †† Membership not required for subscription.

If applicant is a student the teacher signs here.

Name of institution where student is enrolled.

PROCLUB: If you were recruited by an AFS member please provide the following:

Member Name _____ Member Number (if known) _____

* New members accepted Jan. 1–Aug. 31 are credited to full membership for that year. (Back issues of Journals are sent.) Members accepted Sept. 1–Dec. 31 credited to full membership as of next Jan. 1, unless requested otherwise. Membership on calendar year only.

** Bona fide students of fisheries subjects are eligible for Student membership (limited to 6 years). Persons employed full-time not eligible. Teacher endorsement required (see above).

*** Retired membership for Active members upon retiring at age 65 or over.



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