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Regional SFC Reports

Southeastern Fishes Council

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Regional SFC Reports

and the problems this might cause for dredging on the Alabama and Tombigbee Rivers, electric power generation at Mobile's Barry Steam Plant, and minimum flow standards on the rivers. The flyer encouraged anyone potentially affected by the situation to write the Alabama Department of Economic and Community Affairs requesting a study of the economic impact of such a listing, which would then be used to help block listing of the sturgeon.

Regional Reports:

Chairman Bauer commented that we have not been getting reports from the Northwest Region. Herb Boschung suggested that John Harris or Bill Matthews be contacted and asked to take over reporting for the region. Bob Cashner sent regrets that his involvement in a search for a new Dean at the University of New Orleans prevented him from preparing a report. Reports were read as follows:

Fritz Rohde -	Northeast
Noel Burkhead -	Southeast
Dave Etnier -	North-Central
Bernie Kuhajda -	South-Central

After accepting a motion to adjourn, Chairmen Bauer closed the meeting at 6:35 PM.

Respectfully Submitted,
Hank Bart, Jr., Secretary/Treasurer

REGIONAL SFC REPORTS

REGION I - Northeast

Two state books have been published. *Delaware's Freshwater and Brackish Water Fishes* by Maynard S. Raasch and Vaughn L. Atlemus, Sr. can be obtained for \$12 from Claude E. Phillips Herbarium, Delaware State College, Dover, Delaware 19901. *The Freshwater Fishes of North Carolina* by Ed Menhinick can be obtained from him at UNCC for \$37.50. We're still waiting for the appearance of Jenkins and Burkhead's tome.

There was a major fish kill on a tributary creek and in the South Fork of the Roanoke River, habitat for *Percina rex* caused by a spill of liquid manure. Instead of a fine, the violator agreed to a conservation easement. *Percina rex* is still present in the Roanoke at Salem. Bob Jenkins and students collected two adults (which were released) in March.

Paul Angermeir and Mel Warren have been working on recovery plans for Virginia state endangered species - Tennessee dace, blackbanded sunfish, sharphead darter, variegated darter, and duskytail darter. There is no field work involved, just assimilation of data and recommendations. The official list of Virginia threatened and endangered species (excluding federal species) was recently recognized. It includes five endangered and ten threatened species. Paul

recently collected *Etheostoma cinereum* in the Clinch River in Virginia.

Gene Maurakis and Bill Woolcott have a two part video on Phylogenetic Systematics available with an instructor's manual.

The North Carolina list of endangered fishes was officially approved in November 1991. It includes 9 endangered, 11 threatened, and 30 special concern fishes. I will be doing survey work on five of these fishes endemic to the upper Dan River in 1992.

F. Rohde

REGION II - Southeast

Conservation Notes

Georgia.--An apparently undescribed redhorse sucker, the "bighead" redhorse, a *Moxostoma carinatum*-like species on the Atlantic slope, was, until recently, only known from two specimens: one from the Pee Dee in North Carolina (1985) and one from the Savannah River, Georgia/South Carolina, in 1980. Bud Freeman, University of Georgia, and Jimmy Evans, Georgia DNR, recently discovered a viable population in the Oconee River, Georgia. The National Fisheries Research Center-Gainesville (NFRC-G) is initiating a survey to document the distribution of this sucker to see if it merits federal conservation protection. Bob Jenkins, Roanoke College, has been enlisted to critically examine the putative specific status of this enigmatic sucker.

Conservation status surveys by the NFRC-G of two undescribed darters, the Cherokee darter, *Etheostoma (Ulocentra)* sp., and the Etowah darter, *E. (Nothonotus)* sp., both endemic to the Etowah River system, will be completed in summer 1992. Bruce Bauer, Breedlove, Dennis, & Associates, and Dave Etnier, University of Tennessee, will describe the Cherokee darter, and Rob Wood, University of Alabama, will describe the Etowah darter as part of his dissertation research. Preliminary analysis of distribution patterns and abundance suggests the Cherokee darter may merit listing as threatened and the Etowah darter as endangered. The Etowah River exhibits chronic degradation from a host of anthropogenic activities; perhaps seven species of fishes have been extirpated from the system, and possibly 35 species of freshwater mussels.

Noteworthy is the recent updating of the Georgia state list of fishes meriting state conservation protection from two species to a realistic 55 species. The efforts of Bud Freeman were pivotal in the formulation of the new list. State DNR officials met with a group of regional ichthyologists (Hank Bart, Tulane University; Noel Burkhead and Steve Walsh, NFRC-G; Dave Etnier, Bud and Mary Freeman, and Carter Gilbert, Florida Museum of Natural History) in November 1991 to develop a list of proposed species.

Florida.--The updated FCREPA (Florida Committee on Rare

and Endangered Plants and Animals) volume on fishes is due out in May 1992. This is updated from the 1978 fish volume, both edited by Carter Gilbert. Carter reports this new volume gives a more realistic assessment of levels of jeopardy for freshwater and euryhaline fishes in Florida. Changes in status rankings resulted from better inventory, taxonomic changes, and in one case, a new state record. The 1978 list had 43 species ranked at various levels of imperilment as opposed to 39 species on the current list. Of the 39 species (about 23% of Florida's native fauna), 36 are freshwater species and three are essentially marine.

Walt Courtenay reports that the peacock bass introduced to south Florida by state fisheries biologists is probably not *Cichla ocellaris*. The peacock bass introduced to Florida originated from Venezuela, via Texas, apparently outside the known range of *C. ocellaris*. At least it's not *Lates*.

Bill Loftus, Everglades National Park, has received reports of visual sightings of the peacock bass at a boundary of the ENP. Bill also reports that pike killifish, *Belonesox belizanus*, and the Mayan cichlid, *Cichlasoma urophthalmus*, have dramatically extended their ranges in the park and now occur in natural habitats as opposed to disturbed or man made habitats.

The Gulf sturgeon population in the Suwannee River is entering the fourth year of study by the NFRC-G. Movements and habitat use by juvenile and adult fish are fairly well understood from radio tagging studies, but remain a mystery for YOY sturgeons. Scant data suggest that YOY may use the headwater reaches of the system in Florida and possibly Georgia.

Of general interest to the SFC, the zebra mussel was just detected in Pickwick Reservoir of the Tennessee River. It is quite possible that the zebra mussel will enter the Mobile drainage via the Tenn-Tom Canal. It is feared that zebra mussels may well cause the extinction of some native mussels. The NFRC-G is responsible for the national tracking of the zebra mussel.

Research Notes

Gary Meffe, Savannah River Ecology Laboratory.--Continues to work on life history evolution of *Gambusia holbrooki* and on energetics relative to lipid storage. He is in the early planning stage of developing a college level textbook on conservation biology; hopes to complete life history study of *Aphredoderus* this year.

Bud and Mary Freeman, UGa.--Have been taking data on a curious new (?) *Percina* from the Chattahoochee system in Georgia. Mary has been studying movement in *P. nigrofasciata* in a Flint River tributary in south Georgia. Bud continues to be very active in Georgia ecopolitics. Bud, with Noel Burkhead, have a peculiar bass from the upper Savannah that is spotted bass-like, but has distinct pigmentation patterns in young and juveniles.

Carter Gilbert, FMNH.--Edited and contributed to the current FCREPA volume on fishes, expected to be out in May; is making good progress on the Florida fishes book with Jim Williams; all other studies are on hold until Florida fishes

book is completed.

Noel Burkhead, NFRC-G.--Authored with Bob Jenkins the chapter on fishes in the book Virginia's Endangered Species; reported with Jim Williams on the hybrid golden shiner X rudd; presently conducting conservation status surveys on the "bighead" redbreasted sunfish, and the Cherokee and Etowah darters; is analyzing data on spawning behavior of the endangered boulder darter.

Bill Smith-Vaniz has recently joined the NFRC-G on a part time basis. Bill will be working on exotic fishes with Jim Williams.

Steve Walsh, NFRC-G.--Recently began working for the USFWS; is responsible for global climate change studies in southern Appalachian fishes. Steve has about completed the construction of a temperature tolerance room as a part of this study.

Jim Williams, NFRC-G.--Authored with Glenn Clemmer the recent description of the Alabama sturgeon, *Scaphirhynchus suttkusi*; with Walt Courtenay and Dawn Jennings the Appendix 2 on exotic fishes in the Common and Scientific Names of Fishes; with Dawn Jennings the data base for exotic fishes in the Western U.S. Jim is trying to build a freshwater mussel group to study the highly imperiled freshwater mussel fauna in the southeast. Jim suspects we may be on the verge of witnessing a major extinction event of many southeastern mussels.

Buck Snelson, University of Central Florida.--About half finished with his phylogenetic revision of *Elassoma*; has a student studying the genetics of an apparently new *Elassoma* from Florida.

Bruce Bauer, B, D, & A.--Working with Dave Etnier on the description of the Cherokee darter.

Walt Courtenay, Florida Atlantic University.--A stalwart opponent to exotic species introductions, his energy continues unabated. He recently completed a major report on exotic fishes for the Office of Technological Assessment (a research arm of the Continental Congress), which will be utilized in further actions by Congress in addressing exotic species problems.

Bill Loftus, ENP.--Continues to monitor the effects of the three-year drought on marsh fishes. He reports that species diversity has recovered, numbers and biomass are still greatly reduced. Is working with Grant Gilmore, Harbor Branch, to document the specialized freshwater/marine ecotonal fauna of Florida.

N. Burkhead

REGION III - North-Central

Attempts to reintroduce smoky and yellowfin madtoms into Abrams Creek were continued (data provided by Pat Rakes and Peggy Shute of Lifespace Technologies, Knoxville) during 1991. Only one yellowfin madtom nest was harvested,

and only 9 of the 150 eggs survived. These were added to the captive brood stock. For the smoky madtom, percent survival was 32%, with 134 juveniles released into Abrams Creek below the campground. An additional 17 juveniles were added to the captive stock. Reasons for higher than usual egg mortality have been identified and corrected. A May survey of Abrams Creek at the transplant site revealed two adults that were presumably survivors of earlier releases. One was a male under a potential nest rock, and the other was a large, gravid female that had recently died.

On 18 October we made our annual visit to the Little Tennessee River above Fontana Reservoir, North Carolina, to harvest spotfin chubs (*Cyprinella monacha*). We caught 129 spotfin chubs and transported them to Abrams Creek where they were released near the footbridge below the campground. There was no mortality.

People involved in both the above projects are in general agreement that 1992 will be a year to spend more time assessing the results of the previous three or more years of attempted introductions, and evaluating additional transplant sites. Madtom nests will not be harvested from Citico Creek this year, but population monitoring will continue there, and will be increased in Abrams Creek where snorkelers will be looking for both madtoms and spotfin chubs from the campground downstream to Chilhowee Reservoir. In recent years there has been an indication that smoky madtom populations are increasing in Citico Creek (perhaps due to closure of some fords and "car washing" sites); yellowfin madtoms, on the other hand, appear to be decreasing, and may be at dangerously low population levels. An attempt will be made to produce young madtoms from the brood stock of both species currently being held at Lifespace Technologies. If spotfin chubs are harvested from the Little Tennessee again this fall, a new transplant site will be chosen.

Lifespace Technologies is now a non-profit association that has split off of Aquatic Specialists, and is hoping to build a facility near Melton Hill Reservoir (John Tullock's property) for captive propagation of jeopardized southeastern fish species. In addition to the two madtoms mentioned above, plans are underway to propagate *Etheostoma* (*Catonotus*) sp., the duskytail darter.

Hank Bart, Noel Burkhead, Dave Etnier, Carter Gilbert, and Steve Walsh joined Bud and Mary Freeman and representatives of the Georgia DNR in drafting and recommending a new list of jeopardized fish species for Georgia. A similar update is planned for Tennessee.

Status survey work has been active, with Mel Warren's survey of the undescribed palezone shiner; Steve Layman on the undescribed *Doration* from the upper Caney Fork and the undescribed *Catonotus* related to *E. nigripinne* from the same area; Brooks Burr and Jim Grady are starting on middle Duck River species *Etheostoma aquali*, *E. striatulum*, and the *Noturus elegans* representative(s) of that area; Pat Rakes will be working with *Fundulus julisia*; Noel Burkhead and Jim Williams are likely to be conducting additional studies on *Etheostoma wapiti*. Requests for information to list the palezone shiner and the Caney Fork *Doration* have been made

by Melvin and Steve, respectively.

Charley Saylor reports that final approval is virtually certain for an attempt to establish lake sturgeon (*Acipenser fulvescens*) in the Clinch River above Norris Reservoir.

The university of Tennessee 1991 regional faunas trip to west Tennessee produced some interesting finds, including (1) a remarkable site for fish collection on the Hatchie River, at Big Eddie on the eastern edge of Hatchie National Wildlife Refuge in the southeast corner of Haywood County--*Noturus stigmosus* was abundant, *Etheostoma histrio* and *E. lynceum* were both present, we got 33 species, and the site is probably collectable at most water levels; (2) *Cyprinella venusta* showed up in the Tennessee River below Pickwick--surely via the Tenn-Tom Waterway; (3) *Cyprinella camura* has appeared in large numbers in the Big Sandy system farther downstream--previously it was known from only a few western tribs to the lower Tennessee River near the Mississippi border; and (4) we found a population of *Cottus bairdi* or something in a tributary to the Red River (lower Cumberland drainage) north of Clarksville--the nearest Cumberland drainage *bairdi* types are in the Caney Fork system far upstream.

Snail darters continue to appear in the lower Holston and lower French Broad rivers in Knoxville, apparently the result of an earlier transplant effort in the Holston. These populations may be the source of the two snail darters found in Little River. Larry Stark, the conceptual artist who visited Tennessee to "fish" for a snail darter, was rewarded for his efforts in lower Big Sewee Creek, where we got several for him to photograph and conceptualize over. Wayne Starnes and Dick Bryant recently found several specimens of *Noturus stanauli* at the Clinch River type locality, where it had not been seen for a worrisome time. Hopefully *Hybopsis cahnii* will follow the same pattern, and reappear in good numbers. A population of *Etheostoma luteovinctum* has been located in Nashville in Brown's Creek, downstream from the mouth of Stones River.

The Tennessee Aquarium is scheduled to open May 1 in Chattanooga. It will feature mostly freshwater fishes and the habitats you might see by following the Tennessee River from the mountains of east Tennessee to the Mississippi River and thence into the Gulf of Mexico. Also featured will be "Rivers of the World" featuring freshwater fishes from major rivers of other regions of North America, Africa, South America, and Eurasia. I have been and continue to be very impressed with this venture, the attention to accurate detail constantly being demonstrated by the staff, and the tremendous educational experience it will be.

The Tennessee fish book galleys have been corrected twice, and layout of pages will begin shortly. Publication guess is the same as I reported it to be last year--a year from this fall.

D. Etnier

REGION IV - South-Central

Jim Stewart of the U.S. Fish & Wildlife Endangered Species Office at Jackson, MS reports that the listing of *Percina aurolineata* and *Cyprinella caerulea* as threatened is pending a ruling and is expected out soon. A survey of populations of *Notropis cahabae* is underway, and the Alabama Geological Survey is studying water quality at several stations in the Cahaba River. Eleven mussels in the Mobile Basin will soon be listed, eight as endangered and three as threatened. The Gulf sturgeon in the Pearl River will be fitted with a transmitter by the state of MS and tracked, if some can be captured. A status review on *Crystallaria asprella* was just finished, and it was determined it does not warrant protection, but should still be listed as a category 3.

Listing of *Scaphirhynchus suttkusi* as endangered is awaiting a signature in Washington. Carl Couret of the U.S. Fish and Wildlife Service in Daphne, AL reports lots of media coverage on the listing of the Alabama sturgeon. Big opposition efforts are coming from the local chamber of commerce. The reason for the uproar may be due to the Service declaring critical habitat for the sturgeon at the same time it is listed, rather than doing so afterwards. He also reports that his office is going to study the effects of channel maintenance by the Corps of Engineers on the mussel fauna in the East Fork Tombigbee River. Adequate flows are needed to flush the system, but must not harm the mussel fauna.

Carl also stated that Alabama is suing Georgia over water rights due to a proposed reservoir on the upper Tallapoosa, and Alabama is at odds with the Corps of Engineers over proposed water reallocation from hydroelectric dams to downstream municipalities. A tristate comprehensive study of systems in AL, GA, and FL by several federal agencies is pending. This study will include the Alabama River from its junction with the Mobile River upstream, including all of its tributaries, and the Flint, Chattahoochee, and the Apalachicola rivers, including Apalachicola Bay.

Allen Mueller of the U.S. Fish & Wildlife Service in Vicksburg, MS reports that an abandoned sand & gravel mining operation captured the Buttahatchee River, shortened its length, and is causing head-cutting. The main concern is for the mussel fauna.

Scott Mettee from the Alabama Geological Survey is finishing studies on coalbed methane gas produced water and its effect on biota in streams of the Black Warrior Drainage. The Survey is also monitoring water quality on the Cahaba River. *Alosa alabamiae* and the Gulf sturgeon are alive and well in south Alabama. New *Cycleptus elongatus* records have been located in the lower Tallapoosa, and *Crystallaria asprella* and *Moxostoma carinatum* were found in the Conecuh River. Steve Harris and Pat O'Neil have a book just out on the caddis flies of Alabama; it covers 350 species with dot distribution maps.

Bill Birkhead from Columbus College, GA recently finished a survey of fishes of Fort Benning Military Reservation, looking for rare, threatened, and endangered

species. He found a few specimens of *Alosa chrysochloris*, and specimens of *Cyprinella callitaenia* were found in impounded sections of the Chattahoochee and in a few lower tributaries, where it was outnumbered by *C. venusta* 50 or 100 to one. *Pteronotopis euryzonus* was widespread in blackwater streams and found in pH as low as 3.8. It was variably present in higher pH streams, and missing from Fall Line streams. Four specimens of *Etheostoma parvipinne* were collected in the Fall Line streams. Shifting sand substrate due to natural instability, and perhaps due to military activities, was noted in many streams on the reservation. Bill recommended establishing buffer zones along the streams.

Steve Ross of the University of Southern Mississippi just completed a preliminary atlas of Mississippi fish distributions with Bill Brenneman. They are currently working on the book of Mississippi fishes. Recent funding was acquired from the U.S. Forest Service to look at flood plain and fish interactions in the Pascagoula Drainage.

Herb Boschung at the University of Alabama has finished a catalog of the freshwater and marine fishes of Alabama, which is being published through the Alabama Museum of Natural History Bulletin. This work covers 950 species and 2500 nominal species. It is due out anytime. Progress is on schedule with the Alabama fishes book that Bo is working on with Rick Mayden. Bo and Rick also recently discovered a snubnose darter in the upper Black Warrior River different from the Warrior darter. Graduate student Rob Wood and Rick are completing a morphological study of the *Etheostoma jordani* complex in the Mobile Drainage, where they have found four different forms.

Hank Bart at Tulane University has found a different form of *Etheostoma parvipinne* found above the Fall Line in the Locust and Sipsey Forks of the Black Warrior River. He is working on it with Mike Taylor, who is the new collections manager at Tulane, formerly the collections manager at Auburn. Hank and Royal Suttkus are collecting material to revise the buffalo fishes and carpsuckers, *Ictiobus* and *Carpionodes*. They have collected material from the Mississippi River to the Altamaha River. As far as Hank knows, Auburn is planning to hire another ichthyologist to fill his vacated position.

Jim Williams of the U.S. Fish and Wildlife Service in Gainesville, FL is working on a mussel survey in the Apalachicola, Chatahoochee, and Flint rivers. He sampled 150 localities last summer, and plans to look at more this summer. From preliminary data, it appears that six to eight species need to be listed. He is also working on mussels in the Escambia River, especially looking for one species, the Alabama pearlshell, which deserves listing.

Malcolm Pierson from Alabama Power is working with Paul Hartfield of the U.S. Fish and Wildlife Service on a mussel survey of the main channel of the Sipsey River. In the summer and fall of 1991, a diverse assemblage of mussels was observed in the lower main channel below U.S. Hwy 82 near Tuscaloosa downstream to the backwaters of the Tenn-Tom Waterway. The bad news is that only one specimen of the endangered *Pleurobema taitianum*, the heavy pigtoe, and no

specimens of *Quadrula stapes*, the stirrup-shell, were observed. A cooperative effort to determine the status of the snail population in the Cahaba River system is underway. Participants are Malcolm, Paul, and Art Bogan of the Philadelphia Academy of Science.

Mike Howell at Samford University, AL reports that the specimens of *Etheostoma nuchale* that were transplanted into Tapawingo Spring three years ago have become an established population; the project is a success! Tapawingo Spring is a tributary to Turkey Creek in the upper Black Warrior River at Pinson in Jefferson Co., AL.

B. Kuhajda

fauna of the Red River, LA.

The Basics of the Basin Research Symposium was held at the University of New Orleans on May 14-15, 1992. The focus of most of the presentations was on the development, pollution and fisheries of the Lake Pontchartrain estuary. Bruce A. Thompson, Louisiana State University, reported on the paucity of fish collection data for the wetlands region since 1975. Michael Farabee and Bob Cashner (University of New Orleans) presented a paper on the fishes of Bayou Lacombe and, among a number of changes in the fish fauna since a 1975 study, noted a complete absence of the previously dominant *Cyprinella venusta*. Bob Cashner, Bill Matthews (University of Oklahoma) and Fran Gelwick (OU) are completing a study on persistence and stability of the fish community of the LaBranche wetlands area on the southwestern shore of Lake Pontchartrain.

R. Cashner

REGION VI - Southwest

Neil Douglas, Northeast Louisiana University, is currently studying longitudinal differences in size distribution for various species of madtoms in some Louisiana streams. He is also directing the research projects of six M.S. students, including: M'Lee Hoyt - "Instream flow preferences of fishes in the Sunflower River, MS"; Madelon Carter - "Range expansion of *Cyprinella lutrensis* in northeast LA"; Steven George - "Life history of *Crystallaria asprella*"; and Sherry Harrel - "Flow velocity preferences of *Percina maculata* and *P. sciera*".

Frank Pezold (also of NLU) reports a mystifying continued interest in the gobiid genus *Oxyurichthys*, and that he is directing the research studies of the following students: Pat Bergeron - "Male/female diet selectivity of *Etheostoma collettei* during reproductive periods"; Wheeler Flaherty - "Seasonal use of Ouachita Mountain headwater streams by smallmouth bass and effects of headwater fish communities on benthic macroinvertebrate population densities"; Chris Metcalf - "Comparison of fish community structure between naturally variable headwater stream environments"; Scott Raborn - "The effect of disturbance and removal on resident oyster reef fish community structure"; Fei Li - "Karyotype evolution in selected gobioid fishes"; Sherry Harrel - "Species composition and age structure of the commercial buffalofish fishery in the lower Ouachita River". Frank is also collaborating with Betty Cochran and Alan Clingenpeel of the USDA Forest Service on a feeding study of introduced rainbow trout in the Little Missouri River.

Ronnie Pitman, Texas Parks and Wildlife Department, had encouraging news about the Texas' Paddlefish Recovery Program. The program is in its third year of stocking and monitoring the re-establishment of *Polyodon* in East Texas rivers. In addition, faculty and students at three Texas universities have been contracted to determine paddlefish responses to salinity as well as characterize water quality and zooplankton in potential paddlefish habitats.

Hank Bart, Tulane University, is directing the M.S. thesis research of Joe Buckley, who is examining changes in the

EDITOR'S NOTE

The "new" format of the PROCEEDINGS comes partially from the suggestions provided in the group survey generated by Herb Boschung. This number and the last are from entirely self-generated camera-ready copy from the efforts of George Sedberry and graphic artist Karen Swanson at the Marine Resources Research Institute in Charleston SC. Printing and postage are now our only major expenses for publication. We have, therefore, moved somewhat into the modern era of desk-top publishing and George has become the desk-top editor designate. In the revamped Information for Contributors it will be noted that we are now requesting, if possible, a PC disk copy to be submitted with the final revised/corrected hard copy to the editor. This will certainly expedite (and cost reduce) our publication of the PROCEEDINGS.

We hope this new format and publishing procedure meets with the approval of the membership. Future anticipated changes include the use of high quality recycled paper stock.

SFC ANNUAL MEETING
15 April 1993, 5-6 PM, Oceans
Room, The Cavalier Hotel, Virginia
Beach, VA

Meeting Announcement and Call for Papers
47th Annual Conference, Southeastern Association of Fish and Wildlife Agencies, Atlanta, GA, 10-13 October 1993. Host Agency: Georgia Fish and Game Division, 1358 Floyd Towers East, 205 Butler Street, S.E., Atlanta GA 30334

Southeastern Fishes Council PROCEEDINGS

Information For Contributors

The primary purpose of the PROCEEDINGS is to publish research papers, critical reviews of activities, area reports and other pertinent information pertaining to the biology and conservation of Southeastern fishes

Manuscripts should be submitted in duplicate. A good guide for manuscript preparation is the Fifth Edition of the CBE Style Manual available from the Council of Biology Editors, One Illinois Center, Suite 200, 111 East Wacker Drive, Chicago, IL 60601-4298.

The entire manuscript including the abstract (required for feature articles only), text, Literature Cited, tables, headings and legends must be double-spaced. The title, author's name and author's address should be centered on the first page. Indicate a suggested running head of less than ten words at the bottom of the first page. An abstract (if necessary) will be placed at the beginning of the text. Acknowledgements will be cited in the text immediately before the Literature Cited. All references cited in the paper will follow the standard format of using the last name of the author(s) followed by the year of publication of the paper. In the Literature Cited, the references will be alphabetical by the author's last name and chronological under a single authorship. The entire reference should be given with the complete name of the journal spelled out if possible.

Tables should be typed on a separate page, consecutively numbered and should have a short descriptive heading. Figures (to include maps, graphs, charts, drawings and photographs) should be consecutively numbered and if grouped as one figure each part block lettered in the lower left corner. In general, high quality prints or photocopies are preferred to the original line art. Legends for figures must be on a separate sheet and each figure must be identified on the back. The desired location of each table or figure should be indicated in the margin of the manuscript.

Manuscripts will subject to editing and will be reviewed by at least two anonymous persons knowledgeable in the subject matter. The edited manuscript and page proofs ("galley") will be furnished to the author. Upon returning the reviewed and corrected manuscript to the editor, a PC disk copy of the final form is also requested. Specific formatting information for the disk will be sent to the author with the edited manuscript. Reprints will be available at a nominal cost.

Regional reports, new notes and other short communications will also be edited and included when possible in the next number.

Only manuscripts from members of The Southeastern Fishes Council will be considered for publication. There is no charge for publishing in the PROCEEDINGS. All manuscripts and short communications should be sent to the editor:

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