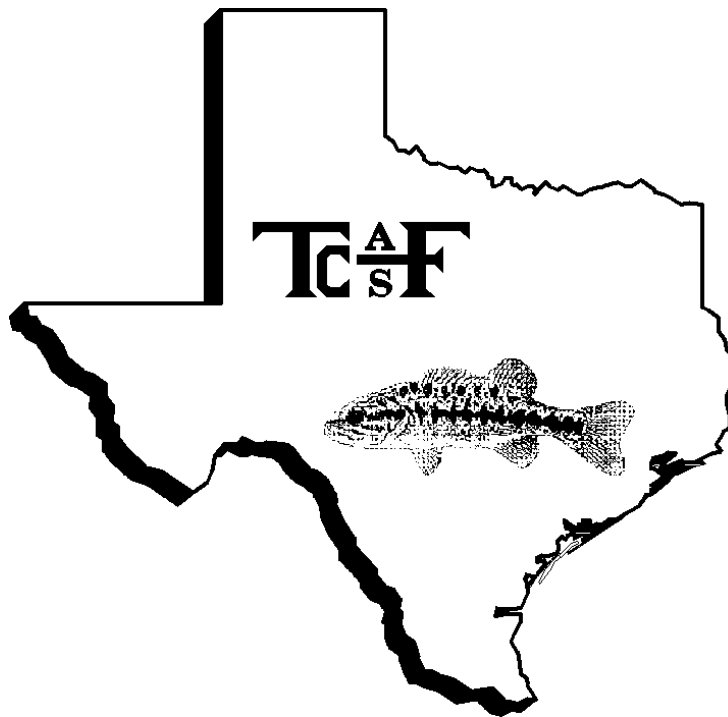


ANNUAL PROCEEDINGS
of the
TEXAS CHAPTER

AMERICAN FISHERIES SOCIETY



Junction, Texas
20-22 January 2002

Volume 24

TEXAS CHAPTER

AMERICAN FISHERIES SOCIETY

The Texas Chapter of the American Fisheries Society was organized in 1975. Its objectives are those of the parent Society – conservation, development and wise use of recreational and commercial fisheries, promotion of all branches of fisheries science and practice, and exchange and dissemination of knowledge about fishes, fisheries, and related subjects. A principal goal is to encourage the exchange of information among members of the Society residing within Texas. The Chapter holds at least one meeting annually at a time and place designated by the Executive Committee.

MEMBERSHIP

Persons interested in the Texas Chapter and its objectives are eligible for membership and should apply to:

Texas Chapter, American Fisheries Society
Secretary-Treasurer
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

Annual membership dues are \$8 for Active Members and \$5 for Student Members.

**ANNUAL PROCEEDINGS OF THE TEXAS CHAPTER
AMERICAN FISHERIES SOCIETY**

Annual Meeting
20-22 January 2002
Junction, Texas

2002 - 2003 Officers

Gene R. Wilde, President
Texas Tech University

Gary P. Garrett, President-Elect
Texas Parks and Wildlife Department

Debbie Wade, Secretary-Treasurer
Texas Parks and Wildlife Department

Editorial Committee: Aaron Barkoh, Chairman
Dave Buckmeier, Joe N. Fries, Gerald Kurten

2003

Published by:
Texas Chapter, American Fisheries Society
c/o Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

TABLE OF CONTENTS

Past Texas Chapter Presidents and Meeting Locations	iii
Texas Chapter Awards	iv
Texas Chapter Award Recipients	v

Panel Discussion "River Access and Use Issues"

Impact of Human Activities on the Llano River

John Robinson	1
---------------------	---

Protect the Resources and the Right of the Public to Use It

Tom Goynes	1
------------------	---

Legal Issues of Rivers: Ownership and Access

Rollin Macrae	1
---------------------	---

Abstracts of Papers Presented at the Annual Meeting but not Published in the Proceedings

Effects of Changes in Site Characteristics on User Value of Water-based Recreation at a West Texas Reservoir

Christopher J. Chizinski, Kevin L. Pope, Gene R. Wilde, David B. Willis, and Edwin J. Rossman	2
---	---

Field Identification Accuracy for White Bass and Hybrid Striped Bass

Kevin W. Storey, J. Warren Schlechte, and Loraine T. Fries	2
--	---

Assessment of a 178-mm Minimum Length Limit on Bluegill at Purtil Creek State Park Lake, Texas

Richard A. Ott, Jr., Timothy J. Bister, and J. Warren Schlechte	3
---	---

Habitat Observations from the South Sulphur River

Christine C. Burgess and Frances P. Gelwick	3
---	---

Effects of an Introduced Predator on Habitat Selection of Prey Species from the Devils River, Texas

Chad Thomas, Timothy H. Bonner, Thomas L. Arsuffi, and Gary P. Garrett	3
--	---

Movement and Habitat Utilization of Triploid Grass Carp, *Ctenopharyngodon Idella*, in the Lower Rio Grande

Zack Thomas, Thomas L. Arsuffi, Timothy H. Bonner, and Earl Chilton	4
---	---

Spatial and Temporal Variability in the Composition of Blenny (Perciformes: Labrisomidae and Blenniidae) Assemblages on Texas Jetties

Timothy B. Grabowski and André M. Landry, Jr.	4
--	---

Predictive Capabilities of Otolith Strontium for Tracing Salinity Histories of Black Drum and Red Drum	
Bert W. Geary and Jay R. Rooker	5
Variation in Fatty Acid Signatures Within <i>Sargassum</i> Mat Communities	
Jason P. Turner and Jay R. Rooker	5
Fish Assemblages on a Shell-ridge System off Freeport, Texas	
Josh O. Harper and Jay R. Rooker	5
Spatio-Temporal Variability in Abundance and Habitat Associations of Juvenile Sand Seatrout and Silver Seatrout	
Harley D. Clinton Jr., Josh O. Harper, and Jay R. Rooker	6
Effects of Acute and Chronic pH Exposures on Survival of Hatchery Fry and Fingerlings of Select Sport Fish Species	
Nathan Pence, Thomas L. Arsuffi, and Gerald Kurten	6
Control of the Toxic Alga <i>Prymnesium Parvum</i> in Koi Carp <i>Cyprinus Carpio</i> Fingerling Rearing Ponds Using Ammonium Sulfate or Copper Sulfate	
Dennis Smith	6
Fish Pathogens: New Threats to Texas Parks and Wildlife Department Hatcheries	
Greg Southard	7
Impact of the Asian Fish Tapeworm <i>Bothriocephalus Acheilonathi</i>: A Recent Introduction for Fishes in the Western United States	
Terry H. Conger and Richard A. Heckmann	7
State Agencies' View of Black Bass Regulations	
Felix Martinez Jr., Kenneth K. Cunningham, and Kevin L. Pope ..	7
Off-Road Vehicles in the Nueces River	
Sky Jones-Lewey	8
Regionalization of the Index of Biotic Integrity for Texas Streams	
Gordon W. Linam, Leroy J. Kleinsasser, and Kevin B. Mayes ..	8
 Abstracts of Posters Presented at the Annual Meeting but not Published in the Proceedings	
History of the Texas Chapter of the American Fisheries Society- Silver Anniversary	
Raymond C. Mathews, Jr., and Fred Janssen	8
Effect of Food Ration, Temperature, and Salinity on Growth of Juvenile Green Sunfish	
Christopher J. Chizinski and Kevin L. Pope	9

Habitat Related Growth of Brown Shrimp and White Shrimp
Michael R. Lowe, Gregory W. Stunz, and Thomas J. Minello 9

Acknowledgments 10

PAST TEXAS CHAPTER PRESIDENTS AND MEETING LOCATIONS

<u>DATE</u>	<u>PRESIDENT</u>	<u>LOCATION</u>
1976		College Station
1976	Ed Bonn	Lake Brownwood
1977	Jim Davis	San Antonio
1978	Bill Rutledge	San Marcos
1979	Bobby Whiteside	College Station
1980	Richard Noble	Arlington
1981	Charles Inman	Austin
1982	Gary Valentine	Kerrville
1983	Don Steinbach	Lake Texoma, OK
1984	Gary Matlock	Port Aransas
1985	Maury Ferguson	Junction
1986	Brian Murphy	San Marcos
1987	Joe Tomasso	Kerrville
1988	Dick Luebke	Abilene
1989	Mac McCune	San Antonio
1990	Bobby Farquhar	Lake Texoma, OK
1991	Gene McCarty	Galveston
1992	Bill Provine	Kerrville
1993	Barbara Gregg	Port Aransas
1994	Lorraine Fries	Lake Travis
1995	Pat Hutson	College Station
1996	Mark Webb	Pottsboro
1998	Katherine Ramos	Athens
1999	John Prentice	Corpus Christi
2000	Paul Hammerschmidt	Bossier City, LA
2001	Charles Munger	San Marcos
2002	Gordon W. Linam	Junction
2003	Gene R. Wilde	Galveson

TEXAS CHAPTER AWARDS

Eight awards may be presented annually. Only members in good standing may make nominations. If nominations reviewed by the Awards Committee are found to be inadequate in one or all categories, awards need not be given. If multiple nominations are received and more than one nominee is considered outstanding, multiple recipients are permissible. The awards and their associated criteria are:

Outstanding Fisheries Worker of the Year - The nominees must be Chapter members in good standing. There are six specialization categories: Administration, Culture, Education, Management, Research, and Technical Support. An award may be presented in each area of specialization. All nominations must be accompanied by supporting data on contributions to one particular area of focus.

Special Recognition in Fisheries Work - The nominees do not have to be Chapter members. They may be individuals or organizations that have made substantial contributions to fisheries in Texas.

Outstanding Presentation at the Annual Meeting - The basic requirements are:

- a. The presentation must be made by one of the authors.
- b. At least one of the authors must be a Chapter member in good standing.
- c. Members of the current Awards Committee shall be ineligible.

The award is for the presentation, not a manuscript or paper. Criteria for evaluation, made by the Awards Committee, and their relative values are:

- a. Introduction - 10 points
- b. Methods - 10 points
- c. Organization - 10 points
- d. Originality - 15 points
- e. Technical Merit - 20 points
- f. Delivery - 15 points
- g. Visual Aids - 15 points
- h. Other considerations - 5 points

Judges will evaluate each presentation immediately after it is given. They will not confer until after the last presentation. The decision will be made based on relative rankings assigned by the judges.

Scholarship Selection - Selection of scholarship recipients is made by members of the Scholarship Selection Committee. University representatives nominate students from their institutions for scholarship consideration. Selection is based on the following criteria:

- a. Academic excellence
- b. Professional activities
- c. Promise of future professional involvement and significant contribution to the field of fisheries science.

TEXAS CHAPTER AWARDS RECIPIENTS

- 1977 Fish Culture - Don Steinbach (TAMU)
Fisheries Management - Edward Bonn (TPWD)
Fisheries Administration - David Pritchard (TPWD)
Fisheries Research - John Prentice and Richard Clark (TPWD)
- 1978 Fish Culture - Pat Hutson (TPWD)
Fisheries Education - Clark Hubbs (UT)
Fisheries Research - Clark Hubbs (UT)
Special Recognition - Edward Lyles (USFWS)
- 1979 Fish Culture - Robert Stickney (TAMU)
Fisheries Education - Richard Noble (TAMU)
Fisheries Management - Gary Valentine (SCS)
Fisheries Research - Phil Durocher (TPWD)
Special Recognition - Charles Inman (TPWD)
- 1980 None
- 1981 Fish Culture - Billy White (TPWD)
Fisheries Education - Bobby Whiteside (SWTSU)
Fisheries Management - Steve Smith (TUGC)
Fisheries Research - Al Green (TPWD)
Special Recognition - Jim Davis (TAMU)
- 1982 Fish Culture - Roger McCabe (TPWD)
Fisheries Research - Clell Guest (TPWD)
Special Recognition - Bob Hofstetter (TPWD)
- 1983 Special Recognition - Robert Kemp (TPWD)
- 1984 None
- 1985 Fisheries Education - Donald Wohlschlag (UTMSI)
Fisheries Research - Connie Arnold (UTMSI)
- 1986 Fisheries Management - Billy Higginbotham (TAES)
Fisheries Research - Robert Colura (TPWD)
- 1987 Fish Culture - Kerry Graves (USFWS)
Special Recognition - The Sportsmen's Club of Texas
Best Presentation - Kerry Graves (USFWS)
- 1988 Honorable Mention (culture) - Loraine Fries (TPWD)
Fisheries Research - Gary Garrett (TPWD)
Special Recognition - Kirk Strawn (TAMU)
Best Presentation - Joe Fries (USFWS)
Honorable Mention (presentation) - Catherine Dryden (TAMU)
- 1989 Fish Culture - Robert Vega (TPWD)
Fisheries Management - Joe Kraai (TPWD)
Fisheries Administration - Gary Matlock (TPWD)
Fisheries Research - Roy Kleinsasser and Gordon Linam (TPWD)
Honorable Mention (research) - Bob Edwards (UTPA)
Best Presentation - Robert Smith (TAMU)

- 1990 Fish Culture - Glen Alexander and David Campbell (TPWD)
 Fisheries Management - Dave Terre (TPWD)
 Fisheries Administration - Gene McCarty (TPWD)
 Best Presentation - Joe Kraai (TPWD)
 Scholarships - Tommy Bates (TAMU:1989), Michael Brice (TTU)
- 1991 Fish Culture - Jake Isaac (TPWD)
 Fisheries Management - Mark Webb (TPWD)
 Fisheries Administration - Pat Hutson (TPWD)
 Fisheries Research - Ronnie Pitman (TPWD)
 Special Recognition - The Wetland Habitat Alliance of Texas
 Best Presentation - Mark Stacell (TPWD)
 Scholarships - Jim Tolan (CCSU), Michelle Badough (SWTSU)
- 1992 Fish Culture - Camilo Chavez (TPWD)
 Fisheries Education - Brian Murphy (TAMU)
 Fisheries Management - Ken Sellers (TPWD)
 Fisheries Research - Bob Colura (TPWD)
 Special Recognition - Bobby Farquhar, Andy Sansom, and Rudy Rosen (TPWD)
 Best Presentation - Maurice Muoneke (TPWD)
- 1993 Fisheries Management - Bruce Hysmith (TPWD)
 Special Recognition - Joe Martin and Steve Gutreuter (TPWD)
 Best Presentation - Jay Rooker (UTMSI)
 Scholarships - Erica Schlickeisen (SWTSU), Brian Blackwell and Nancy McFarlen (TAMU)
- 1994 Fish Culture - Ted Engelhardt (TPWD)
 Fisheries Management - Steve Magnelia (TPWD)
 Fisheries Administration - Dick Luebke (TPWD)
 Special Recognition - Bob Howells (TPWD)
 Best Presentation - Travis Kelsey (SWTSU)
 Scholarships - Kathryn Cauble (SWTSU), Howard Elder and Kim Jefferson (TAMU)
- 1995 Fish Culture - Robert Adami (TPWD)
 Fisheries Education - Bill Neill (TAMU)
 Fisheries Management - Spencer Dumont (TPWD)
 Fisheries Administration - Roger McCabe (TPWD)
 Fisheries Research - Maurice Muoneke (TPWD)
 Special Recognition - Tom Heffernan and Robin Reichers (TPWD)
 S. Ken Johnson (TAMU)
 Best Presentation (s) - Robert Weller (TTU), Robert D. Doyle (ACE)
 Scholarships - Jay Rooker (UTMSI), Robert Weller (TTU), Gil Rosenthal (UT),
 John Findiesen and Karen Quinonez (SWTSU)
- 1996 Fisheries Education - Billy Higginbotham (TAMU)
 Fisheries Management - Gary Garrett (TPWD)
 Fisheries Administration - Gene McCarty (TPWD)
 Fisheries Research - Ivonne Blandon (TPWD)
 Special Recognition - Reeves County Water Improvement Board
 Best Presentation (s) - Craig Paukert (OSU), Gene Guilliland (ODWC)
 Scholarships - Chad Thomas (SWTSU), Anna-Claire Fernandez (UTMSI),
 Kenneth Ostrand, Dawn Lee Johnson
 Technical Support - Jimmy Gonzales (TPWD)
 Honorable Mention (technical support) - Eric Young (TPWD)

- 1997/1998 Fish Culture - Tom Dorzak (TPWD)
 Fisheries Education - Robert Ditton (TAMU)
 Special Recognition - Fred Janssen, Chris Cummings, Dan Lewis, Dan Strickland,
 and Gary Graham (TPWD), Jim Davis (TAMU)
 Best Presentation (s) - Timothy Bonner and Gene R. Wilde (TTU)
 Scholarships - Tony Baker and Allison Anderson (TAMU), Patrick Rice (TAMUG),
 Laurie Dries (UT)
- 1999 Fisheries Administration - Lorraine Fries (TPWD)
 Special Recognition - Pat Hutson (TPWD, retired)
 Best Presentation (s) - Gene R. Wilde and Kenneth G. Ostrand (TTU)
 Scholarships - Scott Hollingsworth and William Granberry (TTU), Brian Bohnsack and
 Michael Morgan (TAMU)
- 2000 Fisheries Research - Gene R. Wilde (TTU)
 Best Presentation - J. Warren Schlechte, coauthors - Richard Luebke and T. O. Smith
 (TPWD)
 Best Student Presentation - Scott Hollingsworth, coauthors - Kevin L. Pope and
 Gene R. Wilde (TTU)
 Special Recognition - Emily Harber, Joe L. Hernandez, Robert W. Wienecke, and John
 Moczygemba (TPWD), Joe N. Fries (USFWS)
 Scholarships - Mandy Cunningham and Calub Shavlik (TTU), Laurieanne
 Lancaster (SHSU)
- 2001 Fisheries Administration - Ken Kurzawski (TPWD)
 Fisheries Education - Kevin pope (TTU)
 Fisheries Management - Brian Van Zee (TPWD)
 Fisheries Research - Reynaldo Patino (TTU)
 Fisheries Student - Timothy Bonner (TTU)
 Technical Support - David DeLeon (TPWD)
 Special Recognition - Rhandy Helton, Rosie Roegner, and Walter D. Dalquest (TPWD)
 Best Presentation - Jason Turner, coauthors - Jay Rooker and Graham Worthy (TAMUG),
 and Scott Holt (UTMSI)
 Scholarships, Undergraduate - Mandy Cunningham and Cody Winfrey (TTU)
 Scholarship, Graduate - Abrey Arrington (TAMU), Laurianne Dent (SHSU)
- 2002 Fisheries Administration - Leroy Kleinsasser (TPWD)
 Fisheries Management - Gordon Linam (TPWD)
 Special Recognition - Raymond Mathews, Jr. (TWDB), Austin Bass Club of the Deaf
 Best Presentation (s) - to be award at the 2003 meeting
 Scholarships, Undergraduate - Felix Martinez, Jr. (TTU), Stuart Willis (TAMU)
 Scholarship, Graduate - Mathew Chumchal (TCU), Michael Morgan (TAMU)

Abbreviations:

ACE - Army Corps of Engineers
 CCSU - Corpus Christi State University
 ODWC - Oklahoma Department of Wildlife Conservation
 OSU - Oklahoma State University
 SCS - Soil Conservation Service
 SHSU - Sam Houston State University
 SWTSU - Southwest Texas State University
 TAES - Texas Agricultural Extension Service
 TAMU - Texas A&M University

TAMUG - Texas A&M University at Galveston
 TPWD - Texas Parks and Wildlife Department
 TTU - Texas Tech University
 TUGC - Texas Utilities Generating Company
 USFWS - US Fish and Wildlife Service
 UT - University of Texas at Austin
 UTMSI - University of Texas Marine Science Institute
 UTPA - University of Texas/Pan American

PANEL DISCUSSION - "RIVER ACCESS AND USE ISSUES"

GENE R. WILDE, *Moderator*

Impact of Human Activities on the Llano River

JOHN ROBINSON (*6712 Northeast Drive, Austin Texas 78723*)

Protect the Resources and the Right of the Public to Use It

TOM GOYNES (*Texas Rivers Protection Association, P.O. Box 219, Martindale, Texas 78655*)

Legal Issues of Rivers: Ownership and Access

ROLLIN MACRAE (*Texas Parks and Wildlife Department, Wetlands Conservation, 4200 Smith School Road, Austin, Texas 78744*)

TECHNICAL SESSION ABSTRACTS

Effects of Changes in Site Characteristics on User Value of Water-based Recreation at a West Texas Reservoir

CHRISTOPHER J. CHIZINSKI, KEVIN L. POPE, AND GENE R. WILDE (*Texas Tech University, Department of Range, Wildlife and Fisheries Management, Lubbock, Texas 79409*)

DAVID B. WILLIS (*Texas Tech University, Department of Agriculture and Applied Economics, Lubbock, Texas 79409*)

EDWIN J. ROSSMAN (*U.S. Army Corp of Engineers, P.O. Box 61, Tulsa, Oklahoma 74121*)

Lake Kemp (a 15,592-acre impoundment of the Wichita River in Baylor County, Texas) is known locally for its striped bass fishery and other water-based recreational opportunities (e.g., jetskiing). Recreational users of Lake Kemp were surveyed during 15 May 2000 -15 May 2002 to investigate the potential effects of increased physical turbidity (that may result from reductions of chlorides in the Wichita River) on user value. Two groups of recreational users (fishermen and non-fishermen) were asked separate survey questions to determine likely changes in visitation to Lake Kemp if turbidity increased as well as to identify user willingness to pay (WTP) to prevent an increase in physical turbidity. Boaters and swimmers would cease to visit Lake Kemp and look for another substitute site if the physical turbidity were to increase from the present average of 10 nephelometric turbidity units (NTU) to 1,000 NTU. Boaters and swimmers expressed a greater WTP to prevent a rise in turbidity to 1,000 NTU than to 100 NTU. Fishermen responded similarly to hypothetical changes in fish stocks at the lake. Fishermen would cease to visit the reservoir if fish stocks declined by 50%; they would look for a suitable substitute site. Fishermen stated a greater WTP to prevent the 50% reduction in fish stocks than a 10% reduction.

Field Identification Accuracy for White Bass and Palmetto Bass

KEVIN W. STOREY (*Texas Parks and Wildlife Department, 2122 Old Henderson Highway, Tyler, Texas 75702*)

J. WARREN SCHLECHTE (*Texas Parks and Wildlife Department, Heart of the Hills Fisheries Science Center, HC 7, Box 62, Ingram, Texas 78025*)

LORAIN T. FRIES (*Texas Parks and Wildlife Department, A. E. Wood Fish Hatchery, 507 Staples Road, San Marcos, Texas 78666*)

We estimated the accuracy of field identification of white bass *Morone chrysops* and palmetto bass female *M. saxatilis* X male *M. chrysops* by Texas fisheries workers and evaluated the reliability of meristic and morphometric characteristics commonly used to differentiate between these two fishes. Electrophoretic and isoelectric focusing analyses of diagnostic proteins were used to verify the fisheries workers' identification of fishes (1,087) sampled from 16 reservoirs throughout Texas. Overall, accuracy of field identification was high and fisheries workers correctly identified all sampled white bass; however, 5% of palmetto bass were incorrectly identified as white bass, and 12% of these fish were found to be F_x hybrids. The majority of white bass (78%) exhibited one basihyal tooth patch while most palmetto bass (89%) had two patches. Palmetto bass had a significantly higher number of lateral stripes extending to the tail and a significantly higher incidence of broken lateral stripes than did white bass. Genetic analysis showed a low incidence (1.8%) of F_x hybrids, indicating reproduction of palmetto bass was an uncommon event in Texas reservoirs. Although isoelectric focusing was not able to detect any F_x hybrids outright, this method, when used in conjunction with protein electrophoresis, served as an additional diagnostic locus that enabled us to detect backcrosses. Managers desiring to regulate white bass and palmetto bass with different harvest restrictions should consider basing regulations on a single characteristic and accepting the consequent harvest of some unprotected individuals, since identification based on a single characteristic or combination of characteristics does not result in 100% accuracy. Alternatively, managers might consider setting *Morone* harvest regulations based on length and bag limits, without regard to species to reduce angler confusion and the concerns of law enforcement.

Assessment of a 178-mm Minimum Length Limit on Bluegill at Purtis Creek State Park Lake, Texas

RICHARD A. OTT, JR. AND TIMOTHY J. BISTER (*Texas Parks and Wildlife, 11942 FM 848, Tyler, Texas 75707*)

J. WARREN SCHLECHTE (*Texas Parks and Wildlife, Heart of the Hills Fisheries Science Center, HC 7, Box 62, Ingram, Texas 78025*)

We compared relative abundance, size distribution, growth, and harvest of bluegill *Lepomis macrochirus* before and after implementation of a 178-mm minimum length limit at 144-ha Purtis Creek State Park Lake, Texas. Relative abundance (catch/h of electrofishing) was significantly lower in post-regulation years (1993-1995, 243/h) than in pre-regulation years (1990-1992, 520/h). However, this decline likely was more attributed to recruitment patterns than to regulation effects. There was no significant difference ($P = 0.18$) between pre- and post-regulation bluegill size distribution. The only significant change in pre- and post-regulation mean length-at-age was for age-1 bluegill (134 mm vs. 123 mm, $P = 0.04$). However, this difference is suspect due to low sample sizes and the effect of extended spawning period on the "actual" age of bluegill captured in the fall. Mean angler total effort as well as catch, release, and harvest rates for bluegill declined significantly ($P < 0.05$) from pre- to post-regulation. As expected, mean weight of bluegill harvested increased significantly (88 to 152 g, $P = 0.02$) but total yield declined (633 to 72 kg, $P = 0.03$) after the regulation was implemented. We were unable to detect any benefits of the regulation to the bluegill population or to anglers. Thus, we recommend removal of the regulation.

Habitat Observations from the South Sulphur River

CHRISTINE C. BURGESS AND FRANCES P. GELWICK (*Texas A&M University, Department of Wildlife and Fisheries Sciences, 2258 TAMU, College Station, Texas 77843*)

The Sulphur River, located in northeast Texas, begins as three forks, the North, Middle, and South Sulphur rivers that eventually join to create the mainstem Sulphur River. Anthropogenic influences upon the Sulphur River Basin have led to extensive channelization along most of the North Sulphur River, half of the South Sulphur River, and much of the mainstem of the Sulphur River. Channelization leads to homogenization of rivers, which decreases available habitat types for fishes. The South Sulphur River offers an opportunity to study fish communities in unchannelized versus channelized reaches within the same river. We hypothesize that the channelized reaches of the South Sulphur River will have decreased species diversity and species richness due to habitat degradation as compared to the unchannelized reaches. Preliminary data indicate that the channelized and unchannelized reaches have approximately the same species diversity and species richness. This is surprising because of the differences in habitat types. The unchannelized reach has more diverse habitats consisting of pools, runs, backwaters, and riffles of varying depth and flow, while the channelized reach is comprised primarily of pools with uniform depth and flow. Most of the species collected from each reach are generalists with a large percentage being tolerant. This indicates that many species in the South Sulphur River are somewhat resistant to environmental disturbances and can inhabit broad ranges of habitats.

Effects of an Introduced Predator on Habitat Selection of Prey Species from the Devils River, Texas

CHAD THOMAS, TIMOTHY H. BONNER, AND THOMAS L. ARSUFFI (*Southwest Texas State University, Department of Biology Aquatic Station, San Marcos, Texas 78666*)

GARY P. GARRETT (*Texas Parks and Wildlife Department, Heart of the Hills Fisheries Science Center, HC 7 Box 62, Ingram, Texas 78025*)

Predators affect prey populations by limiting their use of available resources or by reducing their numbers via predation. These effects often are greater in fish assemblages where a predator has been introduced. In the Devils River, *Micropterus dolomieu* were introduced in the mid-1970s and currently inhabit much of the river. During this expansion *Dionda diaboli*, a federally-listed threatened species, decreased in abundance. The purpose of this study was to assess the effects of *M. dolomieu* on *D. diaboli* and other Devils River fishes (*D. argentosa*, *Notropis amabilis*, *Cyprinella proserpina*, *Gambusia speciosa*) in artificial streams. We found that all species differed ($P < 0.05$) in their selection of at least one habitat variable among systems with predators and those without. In systems with predators, greater numbers of *Dionda* spp. were observed in plants and greater numbers of *G. speciosa* were observed in shallow

water. Consequently, these species persisted in the presence of a predator. For *N. amabilis* and *C. proserpina*, greater numbers were observed near the surface in streams with predators, but both populations were substantially reduced due to predation. We concluded that the introduced predator has the potential to negatively affect *Dionda* spp. and *G. speciosa* by limiting available habitats and *N. amabilis* and *C. proserpina* by predation.

Movement and Habitat Utilization of Triploid Grass Carp *Ctenopharyngodon Idella* in the Lower Rio Grande

ZACK THOMAS, THOMAS L. ARSUFFI, AND TIMOTHY H. BONNER (Southwest Texas State University, Department of Biology Aquatic Station, San Marcos, Texas 78666)

EARL CHILTON (Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744).

Historically, the mainstem of the Rio Grande River in Texas has fluctuated greatly in water levels. Since the 1900s, numerous channel diversion dams and weirs were constructed to help control flooding and to provide sufficient water sources for municipal and agricultural use. In recent years, the combination of drought and increasing water use has substantially decreased the flow in the Rio Grande. As a result, the Rio Grande has experienced an expansive infestation of two exotic plant species: submerged hydrilla *Hydrilla verticillata* and floating water hyacinth *Eichhornia crassipes*. Both species have formed thick vegetative mats in segments of the river, impeding flow. In addition, water hyacinth greatly increases evaporative water loss. The Texas Parks and Wildlife Department, local irrigation districts, and other agencies have explored several methods to control these species. Introduction of triploid grass carp *Ctenopharyngodon idella* may control the vegetation; however, this fish is non-indigenous and possible ecological impacts need to be addressed before large-scale introductions. The primary concern is escapement and potential detrimental effects on native vegetation and fisheries, especially in the bays and estuaries. The purpose of this study was to determine movement and habitat use of a small experimental population of triploid grass carp in the lower Rio Grande. On 10 October 2001, 14 triploid grass carp were released into the Rio Grande near Progreso, Texas, and 11 were released below Anzalduas Dam. A combination acoustic-ultrasonic uniquely coded tag was surgically implanted in the abdomen of each fish to track movement and habitat use (i.e., salinity, water temperature, stream depth, dominant vegetation type, and flow velocity). To date, grass carp have been monitored 1 day, 1 week, 2 weeks and 1 month after their release along 62 kilometers above and below their stocking sites. Monitoring will continue monthly through March 2002. To date, 14 of 25 fish have been located and all have been associated with dense mats of hydrilla. Two fish have migrated upstream through at least one channel diversion dam. Fish movement occurred upstream and downstream and some for considerable distances (1.6 – 26.0 km) from their stocking sites.

Spatial and Temporal Variability in the Composition of Blenny (Perciformes: Labrisomidae and Blenniidae) Assemblages on Texas Jetties

TIMOTHY B. GRABOWSKI AND ANDRÉ M. LANDRY, JR. (Texas A&M University, Department of Wildlife and Fisheries Sciences, College Station, Texas 77843)

Texas jetties serve both as surrogate rocky shore environments and artificial reefs to structure-dependent organisms. Prior to jetty construction 120 years ago, structured, hard-bottom habitats and associated cryptic species were effectively absent from the northwestern Gulf of Mexico coast. Fishes in the Family Blenniidae are a good example of marine fauna whose distributional range may have been interrupted by lack of suitable habitat in the form of jetties. Blennies' cryptic nature and their recent colonization of Texas jetties render them excellent indicators of environmental stress and candidates upon which to model population dynamics of invasive marine species. Blennies were dipnetted from jetty habitats at Galveston, Port Aransas, and South Padre Island, Texas, monthly from May 2000 through August 2001. Four species of blenniids (*Hypseurochilus geminatus*, *Hypsoblennius hertz*, *Hypsoblennius ionthas*, and *Scartella cristata*) and one labrisomid (*Labrisomus nuchipinnis*) contributed to spatially distinct assemblages differing significantly ($P < 0.05$) in species composition, diversity and evenness. *Scartella cristata* was the dominant species at Port Aransas and South Padre Island, and shared this status with *H. geminatus* at Galveston. Mean total length of *S. cristata* differed significantly among study sites and was greatest within the Galveston population. This disparity can be attributed to fewer recruits being captured on Galveston jetties. *Scartella cristata*'s subtropical nature may have lessened its recruitment potential in the more temperate Galveston waters. Assessing differences in community structure may help determine the origins and future development of blenny assemblages on jetties.

Predictive Capabilities of Otolith Strontium for Tracing Salinity Histories of Black Drum and Red Drum

BERT W. GEARY AND JAY R. ROOKER (Texas A&M University at Galveston, Department of Marine Biology, 5007 Avenue U, Galveston, Texas 77551)

Microconstituent analysis of otolith strontium (Sr) is useful for tracing salinity histories of estuarine-dependent fishes. The approach is based on the premise that strontium concentrations in seawater are higher than freshwater. Consequently, by measuring strontium levels along a transect from the core to the outer edge of an otolith, it is possible to reconstruct salinity histories. In this experiment, we tested the effects of salinity and temperature on otolith Sr:Ca ratios for black drum *Pogonias cromis* and red drum *Sciaenops ocellatus*. For each species, four salinity (5, 15, 25, and 35 ppt) and two temperature (23-24 and 30°C) treatments were tested. For each combination, there were three replicate tanks with five fish each. Black drum showed a positive relationship between salinity and Sr:Ca ratios; salinity explained 42% of the variability in otolith Sr. Red drum showed no relationship between otolith Sr:Ca ratios and salinity. Neither species showed a relationship between otolith Sr:Ca ratios and temperature. Otolith Sr:Ca transects taken from wild-caught black drum indicate that coarse-scale movement patterns can be measured using this technique.

Variation in Fatty Acid Signatures Within *Sargassum* Mat Communities

JASON P. TURNER AND JAY R. ROOKER (Texas A&M University, Department of Marine Biology, 5007 Ave. U, Galveston, Texas 77551)

Fatty acid signatures were determined for flora and fauna associated with floating *Sargassum* mats in the northwest Gulf of Mexico. The goals of the study were to determine the variation in fatty acid signatures based upon month of collection and collection site. Samples of autotrophs and heterotrophs associated with the *Sargassum* mats were collected from three locations (Galveston Inshore, Galveston Offshore, and Port Aransas Offshore) over a period of 4 months (May-August) in 2000. Fatty acids were isolated using chloroform/methanol extractions and signatures were determined using gas chromatography. Temporal variation in fatty acid signatures was significant ($P < 0.05$), particularly between early (May-June) and late (July-August) season samples. Conversely, sample location did not appear to influence fatty acid signatures, indicating a natural stability in *Sargassum* communities within the northwest Gulf of Mexico during any given month. Results suggest that fatty acid signatures are not stable over time and thus caution must be exercised when using the technique to reconstruct feeding histories.

Fish Assemblages on a Shell-Ridge System off Freeport, Texas

JOSH O. HARPER AND JAY R. ROOKER (Texas A&M University at Galveston, 5007 Avenue U, Galveston, Texas 77551)

Low-relief shell ridges in the northwest Gulf of Mexico, such as Freeport Rocks Bathymetric High (FRBH), have been identified as potentially important habitat for several commercially or recreationally important fishes. During seven cruises from May to December of 2000, we trawled 18 sites on FRBH and adjacent mud habitats. A total of 28,987 fishes, representing 101 species and 37 families, was collected. Species diversity and richness declined sharply in late summer and fall. Richness was greatest on the shell ridge, but diversity was greatest inshore of the shell ridge. Hierarchical cluster analysis of all species indicated distinct fish assemblages could be geographically delineated. The eight most abundant species (shoal flounder *Syacium gunteri*, dwarf sand perch *Diplectrum bivittatum*, red snapper *Lutjanus campechanus*, least puffer *Sphoeroides parvus*, silver seatrout *Cynoscion nothus*, largescale lizardfish *Saurida brasiliensis*, yellowfin mojarra *Gerres cinereus*, and sand seatrout *Cynoscion arenarius*) comprised 69% of the total catch and patterns of habitat use were examined for each species individually. Geostatistical depictions of abundance of these eight species indicated density varied as a function of date and habitat type. Results suggested shell-ridges assemblages are distinct from mud-bottom assemblages.

Spatio-Temporal Variability in Abundance and Habitat Associations of Juvenile Sand Seatrout and Silver Seatrout

HARLEY D. CLINTON JR., JOSH O. HARPER, AND JAY R. ROOKER (*Texas A&M University at Galveston, Department of Marine Biology, 5007 Avenue U, Galveston, Texas 77551*)

Trawling cruises were conducted from May to December 2000 on the Freeport Rocks Bathymetric High (FRBH) and associated habitats to quantify spatio-temporal variations in patterns of habitat use of silver seatrout *Cynoscion nothus* and sand seatrout *C. arenarius*. Overall, 2,043 silver seatrout and 1,331 sand seatrout were collected. Silver seatrout densities ranged from 0-395 fish/ha with greatest abundance in December. A relatively high percentage (50.4%) of silver seatrout were collected off the bathymetric high in adjacent mud-bottom habitats. Densities of sand seatrout ranged from 0-321 fish/ha and peak abundance occurred in June. Sand seatrout were most abundant at the bathymetric high-mud interface. Densities of both species were low on the bathymetric high, suggesting that these species prefer low-relief, mud habitats.

Effects of Acute and Chronic pH Exposures on Survival of Hatchery Fry and Fingerlings of Select Sport Fish Species

NATHAN PENCE AND THOMAS L. ARSUFFI (*Southwest Texas State University, Department of Biology Aquatic Station, San Marcos, Texas 78666*)

GERALD KURTEN (*Texas Parks and Wildlife Department, A.E. Wood Fish Hatchery, San Marcos, Texas 78666*)

Differing pH levels between indoor spawning raceways and outdoor production ponds may be a factor contributing to low survival of fry and fingerlings. The standard procedure for Texas Parks and Wildlife Department is to move fry and fingerlings from indoor hatching and holding facilities to outdoor production ponds. Often, outdoor pH levels are higher than indoor pH levels and fry and fingerlings are thus subjected to changes in pH. We determined the effects of acute (instantaneous) and chronic (acclimated) pH changes on fry or fingerlings of four sport fish species: Florida largemouth bass *Micropterus salmoides floridanus* (FLB), smallmouth bass *Micropterus dolomieu* (SMB), channel catfish *Ictalurus punctatus* (CCF), and bluegill sunfish *Lepomis macrochirus* (BLG). To test for tolerances to acute pH levels we conducted single-factor experiments with five pH treatments (9.0, 9.4, 9.7, 10.0 and 10.5) and a control (ambient hatchery water pH of 8.1) and used survivorship after 6 h as a response variable. The effects of a chronic pH change from 8.0 to 10.0 on survivorship were evaluated over five time intervals (0, 15, 30, 45 and 60 min). Results show that pH tolerance is species specific, even within the same family and genus. Florida largemouth bass fry and CCF fry exhibited high mortality at pH levels around 9.5 while BLG fingerlings and SMB fry did not exhibit high mortality until a pH level of 10.0 or higher. Smallmouth bass fry, CCF fry, as well as BLG-fingerlings followed a general pattern of higher survivorship with longer acclimation times. Florida largemouth bass fry however, exhibited a fairly constant mortality rate even with increased time for acclimation. These results suggest it is important for hatcheries to adopt culture methods that account for species-specific pH tolerances to maximize survival of fry and fingerlings.

Control of the Toxic Alga *Prymnesium Parvum* in Koi Carp *Cyprinus Carpio* Fingerling Rearing Ponds Using Ammonium Sulfate or Copper Sulfate

DENNIS SMITH (*Texas Parks and Wildlife Department, Dundee State Fish Hatchery, Route. 1 Box 123A, Electra, Texas 76360*)

Prymnesium parvum is a toxic alga that has been responsible for numerous fish kills in Texas reservoirs, rivers, and hatcheries as well as many other locations around the world. In 2001 we compared the effectiveness of 10-mg/L ammonium sulfate and 2-mg/L copper sulfate in controlling *P. parvum* and its associated toxicity in koi carp fingerling rearing ponds. Nine 0.4-ha plastic-lined ponds were used for the study: three received ammonium sulfate (treatment 1), three received copper sulfate (treatment 2), and three received no treatment (control). Ponds were filled and treated prior to stocking with fingerling koi carp (27 mm total length; 250,000 fish/ha) on August 2. Bioassay was performed weekly with water from each pond to monitor toxicity. All treatments 1 and 2 ponds were treated if the bioassay test was positive for any of the treatment ponds. Treatment ponds received two follow-up treatments before the fish were harvested after 75 or 76 days in production. Bioassay results for the ammonium sulfate and copper sulfate treatments were not significantly different but each was significantly different from that of the control ponds. The bioassay results

for the control ponds indicated that *P. parvum* became toxic to the fish. Production variables (harvest biomass, mean harvest length, and survival) were significantly different among the three study groups. No fish was harvested from the control ponds. Survival, harvest biomass and mean harvest length were 23%, 30.7 kg and 46.7 mm, respectively for ponds treated with copper sulfate and 58%, 299.8 kg and 71.2 mm, respectively for ponds treated with ammonium sulfate. Fish production was approximately ten-fold better with ammonium sulfate than with copper sulfate.

Fish Pathogens: New Threats to Texas Parks and Wildlife Department Hatcheries

GREG SOUTHARD (*Texas Parks and Wildlife, A. E. Wood Fish Hatchery, 507 Staples Road, San Marcos, Texas 78666*)

Aquaculture professionals struggle with maintaining the delicate balance between intensive fish culture and disease outbreaks. Recent introductions of exotic species into Texas water bodies apparently have included new pathogens that are being encountered by fish health specialists. Viruses (e.g., Largemouth bass virus (LMBV) and Channel catfish virus (CCV)), parasites (e.g., *Myxobolus koi*), bacteria (e.g., *Edwardsiella ictaluri*) and algal toxins (e.g., *Prymnesium parvum* ichthyotoxin) pose significant threats to hatchery production of many fish species. Fish health specialists seek to deter proliferation of pathogenic organisms into hatcheries and to prevent their spread into rivers and lakes. Current laboratory methods for identifying these pathogens and related problems, including microscopic cell counts and bioassays for toxin-producing algae, cell culture and the polymerase chain reaction (PCR) to verify LMBV and CCV viral DNA, and microscopy for parasitic pathogens, will be discussed in this presentation. Future research needs, such as a non-lethal test for LMBV to be utilized on TPWD largemouth bass broodstock, a LMBV vaccine for broodstock and fingerlings, fluorescence microscopy to identify *P. parvum*, as well as the evaluation of algacides for control of *P. parvum* in fish production ponds, will also be discussed.

Impact of the Asian Fish Tapeworm *Bothriocephalus Acheilonathi*: A Recent Introduction for Fishes in the Western United States

TERRY H. CONGER (*Texas Animal Health Commission, P. O. Box 12966, Austin, Texas 78711*)

RICHARD A. HECKMANN (*Brigham Young University, Department of Zoology, Provo, Utah 84602*)

The strategy of planting sterile grass carp *Ctenopharyngodon idella* into reservoirs to combat hydrilla is not without hazards if proper precautions are not taken prior to release. The Asian tapeworm *Bothriocephalus acheilognathi* has been reported in several states in the western United States. Its presence likely is due to the introduction of grass carp from Asia and the use of live minnows for fish bait. The tapeworm is reputed to be the best-known dangerous helminthic parasite that has been introduced into waterways throughout the world. The parasite is not host-specific and has been shown to cause significant pathology in smaller hosts. The cestode will penetrate the intestinal wall, causing intestinal impaction and lethal hepatic and gonadal inflammation to the extent that it has threatened various endangered species (in particular the woundfin minnow *Plagopterus argentissimus* and the Virgin roundtail chub *Gila robusta*) in the Virgin River in southern Utah. The treatment of carp with the anthelmintic praziquantel (Droncit, Bayvet Div., Cutter Lab) has been demonstrated to be effective against the parasite. This procedure is important in preventing the introduction of the parasite with the carp into waterways.

State Agencies' View of Black Bass Regulations

FELIX MARTINEZ JR., KENNETH K. CUNNINGHAM, AND KEVIN L. POPE (*Texas Tech University, Department of Range, Wildlife, and Fisheries Management, Lubbock, Texas 79409*)

Population dynamics (recruitment, growth, and mortality) within black bass *Micropterus* spp. species are variable, yet a majority of the state agencies in the United States group black bass for statewide regulations. A mail survey was conducted during summer 2001 to collect data on state agencies' perspective of black bass regulations and to determine why most state agencies regulate black bass as a single group. Forty-four of 49 (90%) state agencies responded to the survey. Over 90% of respondents believed that population dynamics differed among largemouth bass *M. salmoides* (LMB), smallmouth bass *M. dolomieu* (SMB), and spotted bass *M. punctulatus* (SPB). However, many (38%: LMB-SMB; 50%: SMB-SPB; 32%: LMB-SPB) respondents did not believe that regulations should differ among these

species, and most (69%: LMB-SMB; 67%: SMB-SPB; 80%: LMB-SPB) respondents believed that law enforcement personnel did not favor species-specific regulations for black bass. Common reasons for opposition to species-specific regulations include preference for simple regulations and anglers' inability to distinguish between species. When specifically questioned, many (29%: LMB-SMB; 20%: SMB-SPB; 57%: LMB-SPB) respondents believed that anglers could not distinguish between these three species, although 86% of state agencies attempt to educate anglers of their morphological differences. Surprisingly, many (54%: LMB-SMB; 56%: SMB-SPB; 30%: LMB-SPB) respondents believed that anglers favored species-specific regulations, but only 20% of state agencies favored changing their current regulations.

Off-Road Vehicles in the Nueces River

SKY JONES-LEWEY (*Nueces River Authority, 200 E Nopal, Suite 206, Uvalde, Texas 78802*)

Off-Road Vehicle (ORV) recreation is growing in popularity and reaching some of the most remote state-owned lands of Texas. This form of recreation is hazardous to aquatic environments and would never be tolerated in private streams or in managed public fisheries. Industry-published ORV user's guides warn against their use in streambeds because of damage to aquatic habitat. Vehicle fluids and churning vehicle wheels pose threats to stream substrate composition and benthic populations. The upper Nueces River from La Pryor to Hackberry remains relatively untouched by industry or development. Agriculture along this greater than 100-mile section of river has historically been limited to livestock grazing, and the flood-prone river bottom land traditionally has been fenced out of pastures. The Nueces River Authority is working with biologists to examine the extent of existing damage in the upper Nueces and with various levels of government to protect the river from further abuse. Existing laws appear inadequate to address the issue of ORV recreation in public streams.

Regionalization of the Index of Biotic Integrity for Texas Streams

GORDON W. LINAM, LEROY J. KLEINSASSER, AND KEVIN B. MAYES (*Texas Parks and Wildlife Department, 505 Staples Road, San Marcos, Texas 78666*)

The U.S. Environmental Protection Agency has strongly emphasized the need to accelerate the development and application of biological monitoring techniques in state monitoring programs, but at the same time has stressed the importance of combining these new biological criteria and assessment methods with traditional chemical and physical procedures. Stream assessments in Texas have evolved from emphasizing water quality to now including habitat and biological evaluations. The Texas Natural Resource Conservation Commission has the primary responsibility for monitoring the quality of state waters and uses a modified version of the Index of Biotic Integrity (IBI) to evaluate fish communities. This IBI is applied statewide with no modification of scoring criteria from region to region. The Texas Parks and Wildlife Department has developed a regionalized IBI based upon fish community data collected from minimally disturbed streams across the state. Comparison of statewide versus regionalized IBI results indicates the condition of the fish community is better represented by the regionalized criteria.

POSTER SESSION ABSTRACTS

History of the Texas Chapter of the American Fisheries Society- Silver Anniversary

RAYMOND C. MATHEWS, JR. (*Texas Water Development Board, 1700 N. Congress Ave., Austin, Texas 78711*)
 FRED JANSSEN (*Texas Parks and Wildlife Department, 4200 Smith School Road, Austin, Texas 78744*)

The Texas Chapter AFS celebrated its Silver Anniversary this year. Special efforts were made to contact the original 83 charter members to personally invite them to attend this celebration. Nineteen charter members attended and were recognized during the banquet. Membership has ranged from 83 charter members to nearly 250. Presently, the Texas Chapter has eleven standing committees, which include Awards, Continuing Education, Editorial, Endowments, Internet, Issues, Membership, Nominating, Pond Management, Publicity/Exhibits, and Student Outreach. An Archives Ad Hoc Committee was added following the Silver Anniversary meeting. This committee was charged with the task of organizing and maintaining the Chapter's files, assimilating historical information, and documenting the history of the

Chapter. Each year, the Chapter hosts an annual meeting, which typically includes about twenty scientific papers, some of which are published in a Proceedings that became a peer-reviewed literature in 1991. Fundraising auctions and raffles have also been an important element of the annual meetings, with proceeds going toward the funding of student scholarships. The Chapter has awarded nearly 100 scholarships. Non-monetary awards may also be given annually to "The Outstanding Texas Fisheries Worker of the Year" in eight categories.

Effect of Food Ration, Temperature, and Salinity on Growth of Juvenile Green Sunfish

CHRISTOPHER J. CHIZINSKI AND KEVIN L. POPE (*Texas Tech University, Department of Range, Wildlife and Fisheries Management, Lubbock, Texas 79409*)

Food availability, predation, and the physical environment all play a crucial role in fish recruitment. Faster growth in early life stages of fish often results in increased survival and recruitment to age 1. Three commonly identified variables affecting growth of age-0 fish are food availability, water temperature, and salinity. A randomized block design was used to test the differences in growth rates of age-0 green sunfish (*Lepomis cyanellus*) subjected to three treatments (temperature, food ration, and salinity). Food-ration level was the most significant main effect influencing the growth of age-0 green sunfish over the 30-d period with greatest growth for fish provided with largest rations. Temperature was the next most significant main effect influencing growth of age-0 green sunfish. Salinity had no significant effect on growth of age-0 green sunfish. Therefore, prey availability is the most important factor for growth of young green sunfish and is likely important in determining year class strength.

Habitat-Related Growth of Brown Shrimp and White Shrimp

MICHAEL R. LOWE, GREGORY W. STUNZ, AND THOMAS J. MINELLO (*Fishery Ecology Branch, National Marine Fisheries Service, Southeast Fisheries Science Center, Galveston Laboratory, 4700 Ave. U, Galveston, Texas 77551*)

Growth of white shrimp *Litopenaeus setiferus* and brown shrimp *Farfantepenaeus aztecus* were examined in four estuarine habitat-types: seagrass *Halodule wrightii*, marsh edge *Spartina alterniflora*, non-vegetated bottom, and oyster reef *Crassostrea virginica*. Field caging experiments were conducted in September 2000 for white shrimp and May 2001 for brown shrimp. The daily growth rates for white shrimp were 0.44, 0.35, 0.32, and 0.32 mm/d in seagrass, marsh edge, non-vegetated bottom, and oyster reef, respectively. We found no significant differences ($P > 0.05$) in overall growth among habitat types. The daily growth rates of brown shrimp in seagrass, marsh edge, non-vegetated bottom, and oyster reef were 1.56, 0.86, 0.86, and 0.88 mm/d, respectively. We found significantly higher growth for brown shrimp in seagrass than in the other three habitat types. We also tested two tagging methods, Decimal Coded Wire Tag and Visible Implant Elastomer, for their effects on growth, survival, and tag retention for both species in laboratory experiments. We observed 100% tag retention and zero mortality during the one-week experiment for both species. Neither tagging method showed a significant effect on growth as compared to our non-tagged control animals. These results suggest that brown shrimp selecting for seagrass habitats may exhibit a higher growth rate as compared to other habitat types.

Acknowledgments

The contributions of the abstract authors and the Editorial Committee (Aaron Barkoh, Dave Buckmeier, Joe Fries, and Gerald Kurten) towards the preparation of this Proceedings is gratefully acknowledged.

The entire Chapter is appreciative to the many contributors who donated auctionable and raffleable goods, money, and services for the 2002 meeting in Junction, Texas.

Citation:

Author(s). 2003. Title. Pages ____ in A. Barkoh, editor. Annual Proceedings of the Texas Chapter, American Fisheries Society, Volume 24. Texas Chapter, American Fisheries Society, Austin, Texas.