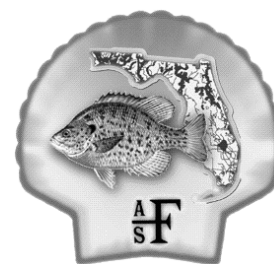


the Shellcracker



FLORIDA CHAPTER OF THE AMERICAN FISHERIES SOCIETY

<http://www.sdafs.org/flafs>

July 2018

President's Message:

Greetings from Eustis,

I am hoping everyone made it through Alberto and the beginning of storm season safe and sound. Hopefully, this will not be a busy year for storms.

Once again, I would like to thank everyone who attended and/or helped out in any way with the recent 38th annual meeting of the Florida Chapter of the American Fisheries Society. It takes a lot to make these meetings a success, luckily we have enough enthusiastic volunteers to make it look effortless. At this year's meeting we had 84 attendees, 21 poster presentations, 38 oral presentations, and for the first time ever a continuing education workshop during lunch on Thursday. Despite lower than normal attendance, we did have a record number of abstracts for talks submitted. Thanks again to everyone who was willing to switch over to poster presentations to make the schedule work. We had enough submissions to the symposium "Improving Communication and Collaboration in Fisheries" that we had to extend it to include sessions during two days. The symposium included 22 talks and the video workshop during lunch. All of the talks were excellent and covered topics such as how to get the word out on what we do, how to include and work with stakeholders, and even how communication at annual Florida Chapter meetings can lead to future collaborative research projects. Communication is often overlooked, but hopefully the knowledge shared and discussed during this symposium will help us all improve as fishery students and professionals.

I would like to congratulate all of our new officers. Bob Heagey is the new president elect. Kevin Johnson has offered to stay on as Secretary-Treasurer. We all owe Kevin a thank you as he does a lot of work to keep the chapter on top of things. Thanks again Kevin, for all that you do. Jeff Hill is now our past president. Jeff did a great job as president. Scott Bisping has stepped up to be the new Newsletter Editor. Also, congrats is in order for Natalie Simon who is the new Student Subunit President and Allison Durland Donahou, the new Vice President. Congrats to Beth Bowers, the new Secretary/Treasurer, and Lauren Kircher for staying on as the University Liaison.

We give out multiple awards each year at the annual meeting and again we would like to congratulate all of the noteworthy award winners. The Rich Cailteux award was given to Chuck Cichra. Chuck has spent his entire career helping make the Florida Chapter the best it can be and making sure that we give as much back to students as we possibly can. Congrats again Chuck! Best professional poster went to Alexis Trotter with runner up going to Chelsea Crandall. Ed Camp got the award for best professional talk with runner up honors going to Wes Porak. On the student side, Steven Garner was awarded best student poster with Jordan Massie getting runner up. The award for best student talk came down to a difference of less than 0.5 points separating them. Geoff Smith received the award for best student talk with Chris Malinowski and Aaron Hasenei tied for runner up. Two great students were presented with the Roger Rottmann Memorial Scholarship, Shane Ramee for his PhD work and Meaghan Faletti for her Master's work. Also, on the student side we need to note that all 22 students that applied for travel grants were awarded one. This is quite an accomplishment for the chapter. I do not know of any other chapters around the country that try to help students as much as the Florida Chapter.

Next year's meeting will be held April 3-5, 2019. This will again be at the Florida FFA Leadership Training Center. Bob Heagey already has a great idea for a symposium titled: "Technology-the Catch in Fisheries: Are we keeping up with advances in harvest, data, communication, and organizing?" We are looking forward to seeing everyone there. Please start spreading the word about this as we hope to increase attendance next year.

Sincerely,
Nick Trippel
Florida Chapter President



Getting in Touch

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Upcoming Events

August 19-23, 2018: 148th Annual Meeting of the American Fisheries Society – Communicating the Science of Fisheries Conservation to Diverse Audiences. Atlantic City, New Jersey.

*Check out our Parent Society's calendar at
<http://www.fisheries.org/Calendar.shtml>
for other events not listed here!*

Interested in contributing something to the Shellcracker?
Email: Scott Bisping at Scott.Bisping@myfwc.com with any articles or information that you would like to be included in the next issue. The deadline for the next issue is September 1st, 2018, so start fishing...

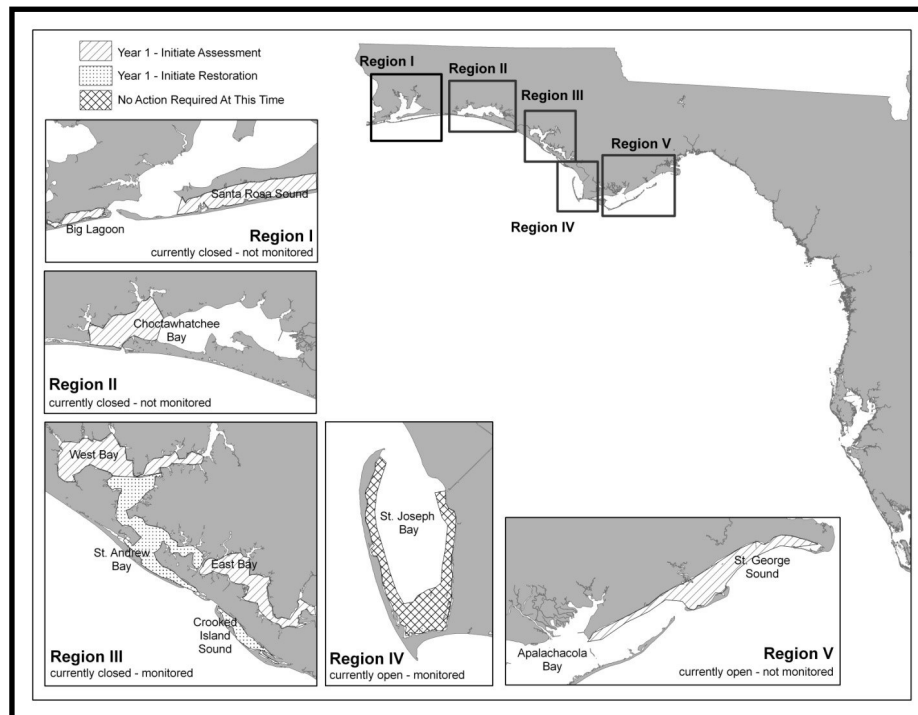
Scallop Restoration in the Florida Panhandle

By: Jennifer Granneman

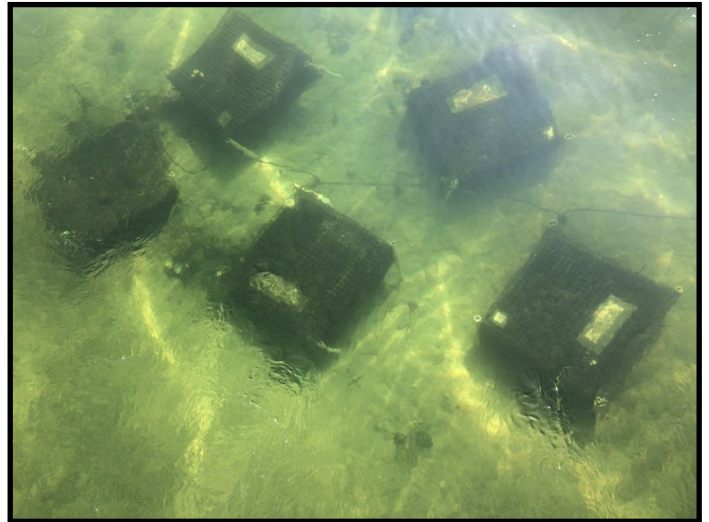
Bay scallops (*Argopecten irradians*) may have a short life, typically living for about a year, but they play a big role in the economies of many coastal Floridian towns, like Steinhatchee and Port St. Joe. In 2016, the scallop team within the molluscan fisheries group began a 10-year project to restore bay scallops to self-sustaining levels in Florida's Panhandle. The project is funded by restoration money set aside after the Deepwater Horizon oil spill and is intended to increase recreational fishing opportunities in the Florida Panhandle. The goal of the project is to increase depleted scallop populations and reintroduce scallops in suitable areas from which scallops have disappeared.



Restoration efforts are focused on coastal estuaries within the Florida Panhandle that have been divided into five regions, as shown on the map. Bay scallop populations in the Florida Panhandle are currently classified as 'collapsed' with population densities below 0.01 scallops per m². In St. Joseph Bay, this collapse may be due in part to a red tide event that occurred from winter 2015-spring 2016. The red tide resulted in a lack of recruitment in 2016, leading to a sharp population decline. Scallop restoration efforts were primarily focused on St. Joseph Bay in 2016-2017. This year, restoration efforts will expand to St. Andrew Bay and St. George (regions III and V).



The scallop team is planning to use a three-step approach to enhance bay scallop populations within targeted restoration areas in the Florida Panhandle by: (1) installing cages holding groups of adult bay scallops (see picture below), (2) releasing hatchery-reared or naturally-harvested juvenile bay scallops (spat) at restoration sites, and (3) releasing hatchery-reared bay scallop larvae. Each year, the scallop team collects adult scallops from St. Joseph Bay and



brings them to a hatchery which provides juvenile scallops the following year. These hatchery scallops are then placed in cages in a no-entry zone in St. Joseph Bay. Placing scal-

lops in cages protects them from predators and increases the likelihood that scallops will successfully produce offspring during the spawning season. Beginning in 2017, scallop collectors were placed in St. Joseph Bay and St. Andrew Bay to collect wild scallop spat. The spat are raised at the Florida State University Coastal and Marine Laboratory and once they reach a size of 30mm they will be planted in cages in their respective bays. Last year we placed 2,500 wild and hatchery-produced scallops in cages in St. Joseph Bay.

In addition to traditional approaches to restoration, our vision for restoring scallops also includes educating the public about our ongoing restoration projects and asking them to be contributing partners in these efforts. To that end, we currently have 185 volunteers helping us to restore scallops in St. Joseph Bay and St. Andrew Bay. In April, we held a series of workshops, hosted by our Sea Grant partners, in Panama City and Port St. Joe to meet with our volunteers. At the workshops, our volunteers, or 'Scallop Sitters', were each provided with 25 scallops and 2 predator exclusion cages. Volunteers that were unable to attend our workshops in April were provided with a webinar to provide training on how to be a scallop sitter (<https://youtu.be/xdqtpPAMHS4>). The scallop sitters placed their cages with scallops either off privately-owned docks or they used their own boats to place their cages in the bay. We hope that by partnering with the community we will increase our chances of successful restoring scallops to stable levels (>0.1 scallops/ m^2) in St. Joseph Bay and St. Andrew Bay.



Minutes of the 38th Annual Meeting of the Florida Chapter American Fisheries Society
Business Meeting
April 12, 2018
FFA Leadership Training Center, Haines City, Florida

President Jeff Hill called the meeting to order at 1910 hours and Kevin Johnson established a quorum.

Past-presidents of the Florida Chapter in attendance were acknowledged: Andy Strickland, Wes Porak, Chuck Cichra, Eric Nagid, and Rich McBride.

Past-presidents of the Southern Division in attendance were acknowledged: Wes Porak.

There were no additions or revisions to the agenda for the 38th Annual Meeting of the Florida Chapter American Fisheries Society Business Meeting, and Jeff Hill asked for and received approval of the agenda.

Wes Porak gave an update on Southern Division business, and talked at length about the 2018 Southern Division meeting in San Juan, Puerto Rico that still took place despite the recent hurricanes. Wes talked about how successful the meeting was and how good the presentations were at the meeting even with lower than normal attendance, and that a benefit of the lower attendance was that attendees to really got to know each other. Wes also mentioned that a highlight of the meeting for him and especially Kim Bonvechio (Southern Division Secretary/Treasurer & Florida Chapter member) was the trash pick-up at the estuary program service day which made plastic pollution really hit home. Wes also talked about the importance and benefits of becoming a member of AFS. Wes stated the 2019 Southern Division meeting will be in Galveston, Texas. Wes then talked about the great support and partnership the Florida Chapter and the Southern Division had in making the 2017 Tampa Annual Meeting such a success, and how the Southern Division made a healthy profit from helping with the Tampa meeting and that money raised will be used for supporting student travel. Wes then finished up by talking about the benefits of becoming an AFS member, in particular the benefits for student and young-professional members, and that AFS is actively involved in national politics by defending science and promoting sound scientific policies in Washington D.C.

Secretary/Treasurer Kevin Johnson asked for a motion to approve the Minutes of the 37th (2017) Annual Business Meeting of the Florida Chapter American Fisheries Society as they appeared in the Shellcracker newsletter, the motion was then seconded and passed.

Kevin Johnson then presented the 2017 Treasurer's Report. The chapter ended the year with \$37,793 in total assets, a \$5,912 loss from the beginning of the year. Chapter expenses put toward the hosting of the Tampa meeting accounted for much of this loss. However, Kevin stated that the chapter will more than make up for this loss with our Tampa meeting profit of \$47,191 that will be applied to the 2018 budget year. Kevin also gave an update on the Roger Rottmann Memorial Scholarship Fund via an email from Larry Connor. The Fund had assets of \$32,491 as of 31 December 2017, representing a \$1,491.80 increase from the 31 December 2016 assets of \$30,999.

Past-President Andy Strickland then facilitated elections for chapter President-Elect. Candidates Chelsey Crandall and Bob Heagey each gave a brief bio about themselves and their vision as chapter president, and then ballots were cast.

Committee Reports

Membership – Kevin Johnson gave an update on membership via an email from Larry Connor. Since the Chapter did not hold its regular spring annual meeting, the ExCom directed me to carry over all 2016 members for 2017. This was done since members that pay their dues at the Chapter annual meeting might not be attending the annual meeting in Tampa. The Florida Chapter ended the year with 309 members including those carried over. The Chapter's paid 2017 membership, was 212 with 97 members carried over from 2016. The Chapter's membership included 59 student members and 203 Society members. The student membership represents an increase of nine members from 2016. There were 142 society members in 2016. However, the increase to 203 society members in 2017 is likely an artifact of holding our annual meeting at the Society's annual meeting and probably does not represent any real change in the Chapter's membership statistics.

Newsletter – Kevin Johnson said that Jessica Feltz, the Shellcracker newsletter editor, moved to take a job in Arkansas, so the chapter is looking for a new editor.

Website – Kevin Johnson stated that Eric Sawyers, who was not able to attend the business meeting, is doing a great job maintaining the chapter's website.

Raffle – Andy Strickland talked about the success of the raffle/silent auction that he and Alan Collins ran at the Tampa meeting and the profit we made for chapter student travel. Andy then talked about how he and Alan are retiring from running the chapter's raffle committee, and how great it was to work with Alan and that Alan is really the one responsible for the success of the raffle every year. Andy also talked about how fun the raffle was to run for all those years and that it was a rewarding experience, and that whoever takes over running the raffle will also find it to be a rewarding experience. Jeff then acknowledged Andy and Alan for the great job they did for many years running the chapter's raffle committee.

Student Scholarships and Awards – Chuck Cichra reminded everyone that proceeds from the previous year's raffle funds student travel grants for this year's chapter meeting. Chuck then said that twenty-two student travel grants were awarded this year. Chuck then thanked the ExCom for using general chapter revenue to make up the difference to fund all 22 travel grants. Students receiving travel grant awards were then acknowledged, and represented Jacksonville University, University of North Florida, Florida International University, Florida State University, Florida Atlantic University, University of South Florida, and the University of Florida. Chuck then gave the history of the Roger Rottmann Memorial Scholarship and summarized the recipient applications. Meaghan Faletti, of the University of South Florida, received the M.S. Rottmann award, and Shane Ramee, of the University of Florida, received the PhD Rottmann award. Each was presented with a certificate and a \$1,000 check.

Florida Chapter Awards – Eric Nagid gave a brief summary of the career of Rich Cailteux and the history of the Rich Cailteux Award, which is meant to recognize individuals for their career contributions to the fisheries profession and the Florida Chapter. Dr. Chuck Cichra was then named the 7th recipient of the Rich Cailteux Award and he received a standing ovation. Eric then read the Chuck's nomination letter and presented Chuck with the award. Chuck then thanked everyone for the nomination.

Student Subunit Report

Amanda Croteau talked about the Subunit using their money, and proceeds from the Sheepshead Shuffle, to fund student travel to Southern Division and Annual Meetings. Amanda said that two students were funded to attend the 2018 Annual Meeting in Atlantic City, but that no students have applied for Subunit travel grants to Southern Division meetings. Amanda then promoted Subunit fundraising efforts, which included the 2018 Sheepshead Shuffle, Chapter logo buffs, and Amazon Smile. Amanda also talked about students writing for the Subunit blog and Facebook account, and thanked the Subunit and Crandall's for this year's meeting workshop. Amanda then announced the incoming Subunit officers: Natalie Simon (UF) – President, Allison Durland Donahou (UF) – Vice President, Beth Bowers (FAU) – Secretary/Treasurer, and University Liaison – Lauren Kircher (FAU). Amanda was then presented with a plaque for her service as Subunit President.

Old Business

Jeff Hill reminded everyone that a motion passed at the previous year's business meeting that increased the Roger Rottmann Memorial Scholarship award amount from \$500 to \$1,000 per the two students, and that chapter needed to have a discussion as to how to fund this increase. Jeff then reminded everyone that the Rottmann Scholarships are funded with annual profits from the scholarship's mutual fund, and also stated that the amount of principal in the mutual fund would have to double to support this increase in the award amount to allow for a double in annual profits. It was stated that a double in mutual fund principal could be accomplished with chapter profits from the Tampa meeting. It was then recommended that an Ad Hoc committee be formed to address what to do with Tampa Meeting profits and Rottmann funding issues. A discussion ensued with Chuck Cichra and Jeff Greenspan about the current amount of money in the Rottmann mutual fund, how much money would actually need to be added to the mutual fund to account for the award increase, and different strategies for accomplishing an increase in the mutual fund's principal. Wes Porak then asked about the concept of this Ad Hoc committee, in which Jeff Hill gave his impression of the committee's duties. Jeff Hill then asked for and received motion for the creation of this Ad Hoc committee, which was seconded and passed.

Installation of New Officers

Andy Strickland announced Bob Heagey as the new President-elect and that Kevin Johnson is staying on as Secretary/Treasurer for one more year. Jeff Hill then turned the meeting over to Nick Trippel as the new President. Nick then gave Jeff a plaque and thanked him for his service as chapter President.

New Business

Nick Trippel said the chapter had received a proposal to sponsor Catfish 2020 – The 3rd International Catfish Symposium and that he felt a sponsorship \$500 would be appropriate. Wes Porak moved to contribute \$500 to the Catfish 2020 meeting, which was seconded and passed.

Jeff Hill then informed the chapter that he, with approval from the ExCom, had written a letter on behalf of the Florida Chapter AFS, to State of Florida congressional representatives in support of the Recovering America's Wildlife Act.

New Business (cont.)

Nick Trippel then asked the business meeting attendees if holding next year's chapter annual meeting in April was a good idea. Andy Strickland asked about April timing of the chapter annual meeting for students. Discussion ensued, and most attendees felt that holding next year's chapter annual meeting in April was appropriate.

Andy Strickland spoke about finding a new chairperson and members for the Raffle Committee. Andy and Alan Colling both again stated that they are ready to move on from hosting the raffle, but that they will help transition the new raffle chairperson and committee next year. A sign-up sheet for the new raffle committee was placed in the back of the business meeting for anyone wanting to volunteer.

Nick Trippel then spoke about the idea of having a Florida Chapter event outside of our annual meeting to give back to the community and to increase relevancy of Chapter members. Discussion ensued where Andy Strickland brought up the idea of a river/stream clean-up and Brandon Thompson brought up the idea of a family fishing event. Wes Porak raised the idea of creating an Ad Hoc committee to come up with and lead a chapter project. A sign-up sheet for the chapter's Project Committee was placed in the back of the business meeting for anyone wanting to volunteer.

Nick Trippel motioned to adjourn the business meeting. The motion was seconded and passed at 2037.



Treasurer's Report Florida Chapter AFS

Kevin Johnson
1 January 2017 to 31 December 2017

	Cash (MS, WF, PP)	Mutual Fund (Morgan Stanley)	Total
January 1, 2017	\$ 25,059.46	\$ 18,646.25	\$ 43,705.71
December 31, 2017	<u>\$ 16,053.53</u>	<u>\$ 21,739.62</u>	<u>\$ 37,793.15</u>
Difference:	\$ -9,005.93	\$ +3,093.37	\$ -5,912.56



Treasurer's Report Florida Chapter AFS (Continued)

Kevin Johnson

1 January 2017 to 31 December 2017

Credits:

Tampa Meeting Profit Advance	\$ 10,000.00
Tampa Meeting Raffle/Silent Auction Income	\$ 3,228.00
Tampa Meeting Sales Income	\$ 623.00
2017 FL Chapter Dues	\$ 152.00
Dues & Membership AFS HQ Refund/Rebate Checks	\$ 1,687.00
DeQuine Trust Deposit	\$ 1,000.00
Rottmann Scholarship Fund Rebate	\$ 1,000.00
Anonymous Donation	<u>\$ 800.00</u>
Total:	\$ 18,491.00

Debits:

Tampa 2017 Meeting Expenses (Chapter)	\$ (3,107.00)
Tampa AFS 2017 Annual Meeting Invoices	\$ (13,556.00)
State of FL Sunbiz Registration	\$ (604.00)
Co-op Research & Man. Symposium Sponsorship	\$ (500.00)
FLMS Meeting Sponsorship	\$ (500.00)
Rottmann Scholarships	\$ (1,000.00)
Travel Grants	\$ (2,920.00)
Puerto Rico SDAFS Meeting Sponsorship	\$ (1,000.00)
Puerto Rico Disaster Relief Donation	<u>\$ (1,000.00)</u>
FFA 2018 Meeting Deposit	\$ (1,500.00)
AFS Web Hosting	\$ (530.00)
AFS Liability Insurance	<u>\$ (150.00)</u>
Total:	\$ (26,367.00)

Current Chapter Finances (as of April 9, 2018):

Tampa Meeting Profit: \$47,191.00

Cash

Morgan Stanley	\$ 60,280.00	(keep \$25k total in MS)
Wells Fargo	\$ 15,391.00	(\$10k 2018 registrations)
PayPal	<u>\$ 219.00</u>	
Cash Total:	\$ 75,890.00	

Mutual Fund

Morgan Stanley	<u>\$ 21,881.00</u>
Grand Total:	\$ 97,771.00



2018 Annual Meeting Presentation Awards



Jack Dequine Student Paper Award

Best: Smith, G., and D. Murie. Potential impacts of non-native Pike Killifish on juvenile Common Snook.

Runner up (s): Malinowski, C. R., F. C. Coleman, and C. C. Koenig. High mercury levels in the Atlantic Goliath Grouper *Epinephelus itajara*: a critically endangered species being reconsidered for a fishery in the southeastern United States

Hasenei, A., R. W. Brill, A. Z. Horodysky, and D. W. Kerstetter. Metabolic physiology and hypoxia tolerance of Lionfish *Pterois* spp. using stop-flow respirometry: Are there physiological limits to inshore invasion?

Professional Paper

Best: Camp, E. V., and B. T. van Poorten. Buffet-style management: increasing satisfaction and participation of diverse anglers

Runner up: Porak, W. Cooperative science with stakeholders and subject matter experts

Student Poster

Best: Garner, S. B., W. F. Patterson III, and C. E. Porch. Cooperative research onboard charterboats to evaluate hook performance, selectivity, and management alternatives for Red Snapper in northern Gulf of Mexico

Runner up: Massie, J., N. Viadero, and J. Rehage. Hurricane driven movements of Common Snook *Centropomus undecimalis* in the Florida coastal Everglades

Professional Poster

Best: Trotter, A., J. Ritch, J. Carroll, D. Westmark, K. Cook, and K. Rynerson. Analysis of reproductive hormones as an indicator of skipped reproduction in Common Snook *Centropomus undecimalis*.

Runner up: Crandall, C., M. Monroe, S. Barry, J. Dutka-Gianelli, B. Fitzgerald, and K. Lorenzen. How to bait the hook: Understanding citizen scientists' motivation to participate



Power Tie Award:

Justin Hill (FWC)

Who is at fault for poor communication and why is it you? Social media edition



Lamp Shade Award:

Quenton Tuckett

For keeping the fire jumping tradition alive and well

Rich Cailteux Award

Chuck Cichra

Chuck Cichra became a Florida Chapter member in 1986, over 30 years ago, when he came to the University of Florida from Texas A&M. He has worked in Florida's lakes, rivers, springs, canals, coastal systems, and wetlands; with fish, invertebrates, and aquatic plants; with water chemistry and water quality; with fisheries management and human use of aquatic habitats; with aquaculture; with fish ecology and non-native species. He has left his mark in all these areas. His extension programs have been highly successful, including "Fishing for Success" and other youth education programs, recreational fishing pond management, and his work with Florida LakeWatch.

Chuck Cichra has excelled in classroom education, in graduate student education, and in extension. He co-teaches Introduction to Fisheries Science/Fish and Limnology, a fixture in both the undergraduate and graduate curriculum at the University of Florida. His Introduction to Fisheries Statistics also is a popular course. It is difficult to say how many graduate students that Chuck has produced because it almost seems to be a "rule" that he sits on everyone's committee. His students range (at least) from Washington State to Florida and hold a variety of professional positions in agencies, academia, and industry. Even more difficult is to number the many thousands of school children who have attended his aquatic ecology and fishing programs.

When Chuck Cichra came to Florida he noticed little participation of students in the Florida Chapter; he set out to help address this issue right away. Chuck was part of the original effort to initiate the Roger Rottmann Memorial Scholarship, the highest honor we bestow on our students. He also helped initiate the student travel awards which cover the room and board of students attending the annual meeting. He has been the chair of the student awards committee from the beginning and still presents these awards at the annual meeting. He also organizes the best student paper and poster judges. He has noted such an increase in student participation that at meetings about half of all presentations are by students and frequently more than 60% of the posters.

Chuck Cichra is a past President of the chapter, past Shellcracker Editor, and was a vital part of the organizing committee for the 1994 American Fisheries Society annual meeting in Tampa. Chuck exemplifies the award criteria as well as the legacy of prior award recipients.



Rottmann Scholarship Recipients

The Doctoral-level recipient:
Shane Ramee, University of Florida

The Masters-level recipient:
Meaghan Faletti, University of South Florida





2018 Student Raffle/Silent Auction



A special thanks to the raffle committee for making the raffle/silent auction in Haines City a great success. We netted a profit of \$1,190.00 from this year's event. Our next raffle/silent auction will take place on April 4th, 2019 at the Annual FLAFS meeting in Haines City. If you are interested in helping, please contact our new raffle committee co-chairs Amanda Croteau (acroteau@ufl.edu) or Chelsey Crandall (kickseas@ufl.edu).



Thanks,
Andy Strickland and Alan Collins

Thank you to the generous donators for the 2018 FLAFS Student Raffle and Silent Auction

STATE	CITY OR AREA	BUSINESS/ORGANIZATION/OR PERSON	STATE	CITY OR AREA	BUSINESS/ORGANIZATION/OR PERSON
FLORIDA	DAYTONA BEACH	STRIPPIN' LIPS CHARTERS	FLORIDA	PANAMA CITY	SAMS CLUB
FLORIDA	GAINESVILLE	DOUBLE TREE BY HILTON			BONEFISH GRILL
		FLORIDA MUSEUM OF NATURAL HISTORY			PAUL BRENT, ARTIST
		SACHELS PIZZA	FLORIDA	PANAMA CITY Bch	SHERATON BAY RESORT
		THE BALLYHOO GRILL			CAPT. ANDERSON MARINA
		HAMPTON INN			CAPT. ANDERSON FISHING FLEET
		ADVENTURE OUTPOST			MARGARITAVILLE
		ONE LOVE CAFE			TOURIST DEVELOPMENT COUNCIL
		CHUCK CICHRA			GULF WORLD MARINE PARK
		PAM FULLER			HALF HITCH TACKLE
		FRESH MARKET			J. MICHAEL'S RESTAURANT
		ACE HARDWARE			EDGEWATER BEACH RESORT
		NORTHEAST SEAFOOD			WALMART - WEST
		RURAL KING			DAVE AND BUSTERS
		WILD BIRDS UNLIMITED			HAMPTON INN
FLORIDA	LAKE TALQUIN	CAPT. DAVID BOYD			JUBILEE DEEP SEA FISHING
		INGRAMS MARINA			DIVER'S DEN
		CAPT. MIKE MERCURI JR.	FLORIDA	ST. PETERSBURG	DIANE PEEBLES
		AQUATIC-IMPRESSIONS.COM			CANOE COUNTRY OUTFITTERS
FLORIDA	LYNN HAVEN	WALMART	FLORIDA	WEST PALM BEACH	WEST PALM BEACH FISHING CLUB
FLORIDA	ST. TERESA	FSU COASTAL MARINE LAB	MARYLAND	BETHESDA	AFS HEADQUARTERS

A special thank you to our FLAFS Student-Raffle Committee!

The Potential Influence of Environmental Stress on Fish Sex

Shane W. Ramee

PhD Candidate

University of Florida Tropical Aquaculture Lab

There is considerable sexual plasticity among teleost fishes. Fish can be classified as hermaphroditic or gonochoristic, meaning that they remain the same sex throughout their lifetime. In gonochoristic species, sexual phenotypes may result from a combination of both genetic and environmental factors. Genetic sex determination is usually regulated by sex chromosome systems such as: $XX♀/XY♂$, $ZZ♂/ZW♀$, or $ZZ♂/ZO♀$, but can also be polygenic with genes from multiple chromosomes contributing to the individual's sexual fate. Sexual differentiation is the period of gonad development after sexual determination. The direction of sexual differentiation can be influenced by environmental factors, which may cause the phenotypic sex to differ from the genotypic sex of the fish. This environmentally dependent plasticity that occurs during the undifferentiated labile period has the potential to result in

skewed sex ratios. In several species, the process of environmental sex reversal has been linked to the stress response axis and regulated by the release of the stress hormone cortisol. My research utilizes two sexually dichromic species, the Dwarf Gourami *Trichogaster lalius* (Figure 1), and Rosy Barb *Pethia conchonius* (Figure 2) as model species for sex differentiation research. These species are also commercially important ornamental species, for which alternative masculinization techniques would benefit Florida's ornamental aquaculturists due to the male's greater commercial value resulting from their more vivid color.



Figure 2. Male (right) and female (left) Rosy Barbs *Pethia conchonius*



Figure 1. Male (above) and female (below) Dwarf Gouramis *Trichogaster lalius*

tions of male fish in ponds stocked during the winter, potentially resulting from environmental sex differentiation. My current research focuses on understanding the role and interaction of environmental stressors on sex differentiation in these two species in order to develop potential new masculinization protocols.

I have conducted a suite of experiments designed to elevate endogenous cortisol levels during the first 30 days post hatch of these two species. These experiments either directly exposed larval fish to cortisol through their feed or manipulated environmental factors such as stocking density, temperature, or salinity to elicit a natural increase in endogenous cortisol levels.

Whole body cortisol levels, survival, growth, and sex ratios of fish in replicate tanks were determined and analyzed for each experimental treatment. Though this research is ongoing, so far, experimental treatments have resulted in significant differences in growth, survival, and whole-body cortisol levels in specific treatments, but no differences have yet been found in resulting sex ratios. There could be several reasons that the conducted experiments have not lead to significant shift in sex ratios. One possibility is that these fish have strong genetic sex determination systems that are not easily affected by the environment. Another possibility is that the spike in cortisol caused by the respective experiment is not happening in concert with the labile period of the sex differentiation process. At this point, all that is known about the labile period of these fish is based on histological studies that describe sexual differentiation occurring around 30 days post hatch. As this research continues, one of the key goals is to better identify the labile period of these species, in order to better focus the timing of environmental treatments.



Figure 3. Shane Ramee performing whole body cortisol extractions