the Shellcracker

FLORIDA CHAPTER OF THE AMERICAN FISHERIES SOCIETY http://www.sdafs.org/flafs

October, 2016

President's Message:

Greetings from Tallahassee! I hope everyone is enjoying the weather as we move into the cooler months. We've had some challenging weather events from Tropical Storm Hermine and Hurricane Matthew. I hope all of you and your families have made it through these storms safely. The end of hurricane season is November 30th, and for many of us, it couldn't get here any sooner.

Our Chapter continues to be focused on next year's annual meeting in Tampa. The website for the annual meeting is http://afsannualmeeting.fisheries.org/. The due date for symposia proposals is January 17th, 2017. Abstracts for papers and posters are due by March 17, 2017. I realize that is a few months away, but it's never too early to be thinking about how to present your research. It's also not too late to get involved regarding sponsorship for the 2017 meeting. Kathy Guindon is heading up the Sponsorship Committee; please contact her at Kathy.Guindon@myfwc.com if you'd like to help. For all other areas of involvement with the 2017 meeting, please contact me at andy.strickland@myfwc.com, Kerry Flaherty-Walia at Kerry.Flaherty-Walia@myfwc.com or Travis Tuten at Travis.Tuten@myfwc.com.

Sincerely,
Andy Strickland
Florida Chapter President

Getting in Touch

American Fisheries Society Florida Chapter Officers

President
Andy Strickland
FWC/FWRI
5300 High Bridge Road
Quincy, FL 32351
Phone: (850) 717-8740
Email: andy.strickland@myfwc.com

President-Elect
Jeff Hill
University of Florida
Tropical Aquaculture Laboratory
1408 24th Street SE
Ruskin, FL 33570
Phone: (813) 671-5230 ext. 118
Email: jeffhill@ufl.edu

Secretary/Treasurer
Kevin Johnson
FWC/FWRI
601 W. Woodward Ave.
Eustis, FL 32726
Phone: (352) 800-5003
Email: kevin.johnson@myfwc.com

Newsletter Editor
Jessica Quintana
FWC/FWRI
601 W. Woodward Ave.
Eustis, FL 32726
Phone: (352) 800-5016
Email: Jessica.quintana@myfwc.com

Past President
Jennifer Rehage
Florida International University
11200 SW 8th Street, ECS 337
Miami, FL 33199
Phone: (305) 348-3804
Email: rehagej@fiu.edu

American Fisheries Society Florida Chapter Student Sub-Unit Officers

President
John Hargrove
University of Florida
Email: tractor@ufl.edu

Vice President
Emily Gipson
University of Central Florida
Email: emilygipson@knights.ucf.edu

Secretary/Treasurer
Amanda Croteau
University of Florida
acroteau@ufl.edu

University Liaison
Natalie Simon
University of Florida
nsimon921@efl.edu

Upcoming Events

November 18: Annual Southern Division Meeting abstract submission deadline

January 16, 2017: Early registration deadline for AFS Southern Division Meeting

February 2-5, 2017: Annual AFS Southern Division Meeting ; Oklahoma City, Oklahoma

Interested in contributing something to the Shellcracker? Email Jessica Quintana at *Jessica.quintana@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 December 14, 2016.

American Fisheries Society
147th Annual Meeting
Tampa, Florida 2017

Goodbye Kansas City, Hello Tampa!!
October 2016 Meeting Planning Update

We are officially in the home stretch for planning the 2017 American Fisheries Society Annual Meeting in Tampa! Leading up to the meeting in Kansas City in August, Florida Chapter members and AFS staff worked together to finalize the budget and get promotional items ready for our booth at the trade show. Here is a summary of our accomplishments:

— Finalized and approved budget thanks to Kevin Johnson (Budget and Finance Chair) and Dan Cassidy (AFS)

— We signed a memorandum of understanding with AFS and the Southern Division detailing our responsibilities from here on out. The Southern Division has agreed to help obtain major sponsorships, donate $5,000 towards the meeting, and give us a booth at their meeting in Oklahoma City to promote the Tampa meeting; in return, they will receive a portion of the proceeds from the Tampa meeting.

— Promotional items were obtained from Visit Florida and Visit Tampa, and the Florida Chapter provided coozies and posters with the 2017 meeting logo, both of which were highly sought after during the tradeshow!

— Our tradeshow booth was a great success! Kylie Briody from Visit Tampa manned the booth throughout the trade show, and Florida Chapter members joined her in shifts at the busiest times.

— Our website is live thanks to Eric Sawyers (Webmaster), check it out at http://afsannualmeeting.fisheries.org/

— The General Co-chairs (Kerry Flaherty-Walia and Travis Tuten) got over some jitters, survived their faces being on the "jumbotron", and gave an enthusiastic pitch to come to Tampa at the business meeting in Kansas City. We also presented a promotional video scripted by Florida Chapter committee members. It is posted on the meeting website and stars our very own Florida Chapter President, Andy Strickland!

— Many great contacts were made by the Florida Chapter committee members in attendance over beers and carp hot dogs (don't ask), and several of us participated in the hand-off meeting with the Missouri Chapter. To just mention a few, Linda Lombardi (Registration chair) shadowed the registration folks to get a handle on the system, Chris Bradshaw (Audiovisual chair) got a rundown on procedures from the AV company, and Kathy Guindon (Fundraising Chair) made lots of contacts for new sponsorships. For a full list of committee chairs, see the meeting page.

Thanks to all that attended the Kansas City meeting and have helped over the last few months in varying capacities. It was a whirlwind, and will continue to be for the next year. On September 21, the Program Committee participated in a tutorial of the Confex system that is used to manage submissions, and due dates for symposia (January 20, 2017) and abstracts (March 17, 2017) are posted on the meeting website. Conference calls with AFS will also be occurring monthly until the meeting. As always, if you are interested in getting more involved, please contact us!

Kerry Flaherty-Walia and Travis Tuten
2017 General Meeting Co-Chairs

Feature Article

Alligator Gar Research in the Yellow River, Florida

Florian Kappen and Maximilian Claus
HAS University of Applied Sciences, Hertogenbosch, The Netherlands

Matthew G. Wegener
Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Holt, Florida 32564, USA

INTRODUCTION

Alligator Gar (*Atractosteus spatula)* is large riverine fish species that can grow to 150 kg and has become a popular sport fish throughout the southeastern USA, due to its large size and prehistoric appearance. However, populations are declining throughout its natural range due to habitat loss (Etnier and Starnes 1993; Brinkman 2008) and previous eradication efforts (Garcia de Leon *et al*. 2001; Aguilera *et al*. 2002). Recognition of the Alligator Gar's function as an apex predator and its ability to support both commercial and sport fisheries has directed efforts away from eradication and towards conservation of this species. Similar to their designation in Florida, directed research on Alligator Gar is rare (Jelks et al 2008). Therefore, the Florida Fish and Wildlife Conservation Commission (FWC) initiated research in 2010 to determine status of Alligator Gar populations in Florida. A telemetry study and population assessment in the Escambia River was completed in 2015 and researchers have recently implemented a similar study on the Yellow River, with the help of two Dutch interns (Figure 1).

METHODS

Multifilament nylon gillnets were used to sample for Alligator Gar from late April through July 2016 for a total of 444 net hours (h). Nets were set in both off-channel and main channel habitat in similar areas where Alligator Gar were collected in the Escambia River (e.g., mouths of oxbows and floodplain tributaries). Captured Alligator Gar were transported in a live well to the Blackwater Research and Development Center in Holt, FL and were held in a 3,785 L fish tank for several days. Prior to release in the Yellow River, a Vemco V-16 transmitter was surgically implanted inside the body cavity underneath the left pectoral fin. After release, movements of the fish were closely monitored using both active and passive tracking techniques. Active daytime telemetry techniques identified the location of tagged individuals using acoustic telemetry gear (Vemco VH110 directional hydrophones and VR100 receivers). Passive tracking information was collected via Vemco VR-2W fixed -station receivers (hereafter SR). SRs were deployed at 23 locations within the Yellow River to capture long-range movements by logging the date and time of individual fish movements (Figure 2). Both linear and core home range was determined for tagged fish with $\geq$ 30 relocations. Linear home range is determined by the most outer relocations where a tagged fish is found. The core home range is the area where a tagged fish is frequently registered and is determined by delineating linear river segments that are used at a higher frequency than the mean of all the used stream segments.

RESULTS AND DISCUSSION

After several months of sampling, very few Alligator Gar were observed in the Yellow River and none were captured. A novel strategy was devised to improve catch on the Yellow River. Researchers planned to catch Alligator Gar in the Escambia River and translocate them to the Yellow River, so the tagged individuals could direct fishing efforts to areas on the Yellow River that contained other Alligator Gar. This sampling model is known as the Judas Technique, where a few individuals are tagged with transmitters and followed to locate aggregations of untagged animals, and has been used successfully on mammals, birds, and fish (Bajer et al. 2011). However, nowhere in published literature have researchers collected the Judas fish from one water body and used it to locate untagged fish in a different waterbody. Concerns of moving genetically-different individuals from one waterbody to another are warranted. Previous telemetry research proved that Alligator Gar migrate between the Escambia and Yellow River (FWC 2012). Further, microsatellite DNA analysis has indicated these populations are not genetically different (Brian Kreiser, Personal Communication, University of Southern Mississippi). Therefore, relocating Alligator Gar from the Escambia to the Yellow River does not affect the genetic integrity of either system. Three Alligator Gar (140-153 cm TL [total length]) were captured in the Escambia River and each fish was translocated to a different section of the Yellow River: upper, middle, or lower. Researchers theorized that distributing the tagged fish throughout the Yellow River would provide an opportunity to determine habitat use (and fishing areas) in a variety of habitats compared to translocating all fish to the same stretch of river.

Figure 1. FWC interns Florian Kappen (top) and Maximilliaan Claus (bottom) holding the 45 kg Alligator Gar caught in the Yellow River by employing the Judas fish technique with translocated Alligator Gar from the Escambia River.

Movement analysis — Movements of the translocated Alligator Gar were relatively similar to each other, even though they were translocated to different areas of the Yellow River. All three individuals moved in a general downstream pattern after translocation and then moved a short distance upstream where they resided within 6 km of each other for the duration of the study. Specifically, the fish stayed near their release site for at least a day. After this, a large (> 5 km) downstream movement to the mouth of the Yellow River was observed by all three individuals. The tagged fish stayed around the mouth of the river for at least 4 days, before moving 2 km upstream. In July, two of the three tagged Alligator Gar made their largest movement upstream (> 7.5 km) to a floodplain tributary, where they were visually observed alongside multiple untagged Alligator Gar. The following day, researchers used gill nets in this floodplain tributary to catch their first Alligator Gar in the Yellow River. After this, the two tagged Alligator Gar went back downstream, to the lowest 5 km of the river where they resided for the duration of the study. The Alligator Gar caught and tagged in the Yellow River stayed around its release site for a few hours after release, before making a small movement downstream. This fish went to a straight section (i.e., run habitat) of the Yellow River, 5 km upstream from the mouth, where it was relocated several times together with two of the tagged Alligator Gar from the Escambia River and several other untagged individuals.

Home range analysis — Alligator Gar with sufficient (> 30) relocations were used in home range analysis. Collection of the Alligator Gar in the Yellow River occurred near the end of the study and did not have enough relocations to be included in this analysis. Mean Linear home-range of Alligator Gar translocated from the Escambia to the Yellow River was 22.33 km (SD 5.01), similar to other studies which ranged from 6.60 to 54.20 km (Sakaris 2003; Brinkman 2008; Buckmeier et al. 2013; Figure 1). The mean core home range was 5.65 km (SD 0.67), similar to the core home range of 4.39 (SD 6.03) observed on the Escambia River (FWC 2015). The similarities in home range size suggest that translocated individuals were not making abnormal movements relative to populations of Alligator throughout their range, and were acting rather "normal" after being moved from one waterbody to another.

Habitat use analysis — All tagged Alligator Gar were successfully relocated with the hydrophone in order to collect habitat data, resulting in 22 relocations. Alligator Gar were constantly relocated at three locations in the main river channel, all within their core home-range (Figure 2). The use of main channel habitat during the summer months has been reported in the Escambia River and may be caused by low water levels (Buckmeier et al. 2013; FWC 2013). These three locations were located at the 1) mouth of the Yellow River, 2) run habitat 5 km upstream from the mouth, and 3) outside bend habitat 6 km upstream from the mouth. Specifically, the tagged fish were often relocated near the edge of a drop off and in the presence of woody debris with some level of canopy cover present.

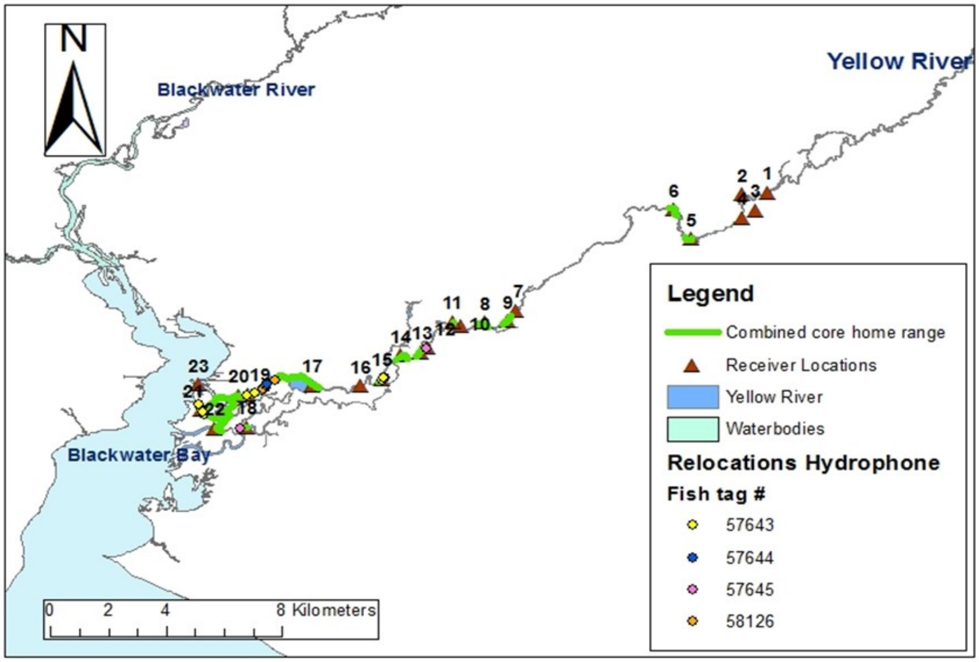

Figure 2. Map of Vemco Vr-2W fixed-station receivers deployed in the Yellow River, FL and combined core home range of tagged Alligator Gar with > 30 relocations.

Management implications — Typical to many research projects, unexpected results of this study may actually have greater impact on future research than the telemetry data we were striving to obtain. The small sample size and brevity of this study resulted in preliminary movement and habitat use data for Alligator Gar in the Yellow River. These results were similar to other published studies on this species, yet data collection will continue to ensure the accuracy of this information. Of possibly greater consequence, this study proved translocated (genetically similar) fish from one water body can be used to locate aggregations of the same species in another water body using the Judas fish technique. Further, initial results suggest behavior may not be affected following translocation. Comparisons between translocated fish and native fish indicated that movement and habitat use was similar, and a relatively short period of time was needed for these two groups of fish to assimilate with each other. This information is extremely valuable to other state agencies who are looking to implement Alligator Gar monitoring programs. The rarity of this species, combined with natural low densities (even in undisturbed populations), often leads to low catch rates that can impede population-status assessments (Adam Martin, personal communication, Kentucky Department of Fish & Wildlife Resources, Murray, Kentucky). In our study, one month was needed for translocated fish to begin acting similarly to native fish and to assimilate with those populations, resulting in increased catch rate of Alligator Gar. Further research in needed to determine if this a similar length of time across the range of this species and whether or not fish propagated in hatcheries, with similar genetic structure, could be used in place of wild fish.

Authors' note: Two additional Alligator Gar were collected on 10/3/2016 in the Yellow River by following tagged fish to an area where untagged individuals were observed the previous week.

LITERATURE CITED

Aguilera C., R. Mendoza, G. Rodrígues, and G. Márquez . 2002. Morphological description of Alligator Gar and tropical gar larvae, with an emphasis on growth indicators. Transactions of the American Fisheries Society. 131: 899–909

Brinkman, E. L. 2008. Contributions to the life history of Alligator Gar, *A tractosteus spatula* (Lac´ep`ede), in Oklahoma. Master's thesis. Oklahoma State University, Stillwater.

Buckmeier, D. L., N. G. Smith, D. J. Daugherty. 2013. Alligator Gar movement and macrohabitat use in the lower Trinity River, Texas. Transactions of the American Fisheries Society. 142: 1025-1035.

Etnier, D. A., and W. C. Starnes. 1993. The fishes of Tennessee. University of Tennessee Press, Knoxville.

Florida Fish and Wildlife Conservation Commission (FWC). 2012. Annual Report for Federal Aid Wallop-Breaux Annual Report F-175-R-1, Tallahassee, FL.

Florida Fish and Wildlife Conservation Commission (FWC). 2013. Annual Report for Federal Aid Wallop-Breaux Annual Report F-175-R-1, Tallahassee, FL.

Garcia de Leon, F. J., L. Gonzalez-Garcia, J.M Herreracastillo, K.O. Winemiller, and A. Banda-Valdes. 2001. Ecology of the Alligator Gar, Atractosteus spatula, in the Vicente Guerrero Reservoir, Tamaulipas, Mexico. Southwestern Naturalist. 46: 151–157.

Jelks, H. L., S. J. Walsh, N. M. Burkhead, S. Contreras-Balderas, E. Diaz- Pardo, D. A. Hendrickson, J. Lyons, N. E. Mandrak, F. McCormick, J. S. Nelson, S. P. Platania, B. A. Porter, C. B. Renaud, J. J. Schmitter-Soto, E. B. Taylor, and M. L. Warren Jr. 2008. Conservations status of imperiled North American freshwater and diadromous fishes. Fisheries 33:372–407.

Sakaris, P. C., A. M. Ferrara, K. J. Kleiner, and E. R. Irwin. 2005. Movements and home ranges of Alligator Gar in the Mobile-Tensaw delta, Alabama. Proceedings of the Annual Conference

Student Section

Student Research Highlight

Hayley Resk
University of Florida

Hayley Resk is a Master's student in the Murie-Parkyn Lab at the University of Florida. Haley moved to Gainesville in June from Portland, Oregon, where she received her B.S. in marine biology from the University of Oregon. Hayley's thesis is focused on developing a model for an alternative management strategy for Greater Amberjack in the Gulf of Mexico.

Greater Amberjack in Florida

Greater Amberjack, *Seriola dumerili*, are a popular sport fish in Florida and have been for many decades. Greater amberjack is targeted heavily by recreational fishermen and in recent years the Gulf of Mexico population of greater amberjack has decreased significantly, causing concern for the fishery (SEDAR 2014). Currently, greater amberjack is managed by a minimum-length limit (MLL). However, even with recent changes to the MLL, there doesn't seem to be any relief for the fishery. Hayley, with the help of her advisors, hypothesize that a harvest-slot-length management plan might be a better management strategy.

Harvest-slot-lengths (also called harvest slots) preserve the intermediate lengths by implementing both a minimum and a maximum length-limit. The goal is to allow the smaller, younger fish to reach sexual maturity giving them the chance to reproduce, and to keep the larger, older fish to stabilize the population. In many species, fecundity increases exponentially with length, due in part because there is both greater body volume to hold eggs and a larger fraction of surplus energy stores to produce eggs. A harvest slot would preserve both of these life stages in order to create a more stabilized age-structure (Gwinn et al. 2013). However, slot size management has not been studied in many species of fish so more research is necessary in determining if one will be successful or not. Therefore, Hayley's thesis will aim to answer this question.

Figure 1: Open bomb capsule

Her thesis focuses on two main areas. First is to answer: do the larger females contribute disproportionately to the spawning stock biomass of greater amberjack and if so, will a harvest slot based management plan be more effective at rebuilding the stock compared to a minimum-length limit?

Hayley's research began this summer answering this question. Part of determining if larger females contribute disproportionately to the stock is quantifying their "fitness". To determine fitness, she will use bomb calorimetry (Figure 1), which essentially determines the energy within a muscle and liver sample of individual fish. Just like people that have similar height and weight can have different muscle mass and body fat, fish can be more "fit" or less "fit". The bomb calorimeter can quantify this fitness level. Samples of frozen muscles are cut up, freeze dried and grinded into a dry powder that can then be placed in a small capsule. This capsule goes inside a larger container, called the bomb, that is filled with oxygen, creating a bomb (hence the name). The bomb calorimeter is a precise machine that is capable of keeping a controlled temperature and pressure in its contained environment (which is a water bath). When an electric spark is sent through the fuse to ignite the sample, the calorimeter can measure the exact change in temperature created from the explosion within the bomb. After correcting for compounds not burned (like acids) and for the fuse wire, what is left is the gross heat given off by the sample: the calories that the sample contained.

This energy data will be combined with the data collected from the liver samples and used to determine how "fit" the individual fish is. With this fitness indicator, Hayley can begin to construct a model, which is the second part of her thesis. Developing a model with programming software will allow me to see if our proposed alternative management plan will indeed help rebuild the stock of greater amberjack in the Gulf through preservation of larger females.

Literature Cited

Gwinn, D.C., M.S. Allen, F.D., Johnston, P. Brown, C.R. Todd, and R. Arlinghaus. 2013. Rethinking length-based fisheries regulations: The value of protecting old and large fish with harvest slots. Fish and Fisheries, 20 pp. Early view: 1-23. DOI: 10.1111/faf/12053.

SEDAR (Southeast Data, Assessment, and Review). 2014. SEDAR 33: Section III:Stock assessment report for Gulf of Mexico greater amberjack. South Atlantic Fishery Management Council, North Charleston, SC.