the Shellcracker

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

October, 2010

President's Message:

Greetings from the deep blue sea!

I have been fortunate this year and am participating in the NOAA Fisheries Service annual bottom longline survey in the Gulf of Mexico. My leg of the survey began off the coast of Galveston, TX, fished south to Tampa, FL and continued to fish as we made our way to port in Pascagoula, MS. We have caught a variety of species from elusive deep-sea sevengill sharks to common red snapper.

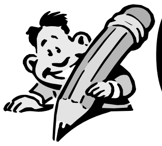
Some of you may be just returning from participating in the 2010 AFS annual meeting in Pittsburgh, and I hope the meeting was productive. Now it is time to start considering your attendance at the 19th annual AFS Southern Division Spring meeting. Our FL chapter executive committee and 2011 Southern Division (SD) meeting program chair and organization committee continue to plan for a fabulous 2011 SD annual meeting in Tampa (Grand Hyatt, Jan 13-16, 2011).

On-line registration is now available (http://www.sdafs.org/flafs/registration.html). Cash, check, or credit card payments are accepted. On-line credit card payments are available through a secured PayPal system for your convenience. Early registration is available through December 3, 2010 ($100 professional, $85 students), providing you a savings of $35. A $60 one day registration is also available. In addition to the technical committee meetings and symposiums, we have organized five workshops on a variety of topics: simulation tools, population dynamics, working with stakeholders, communication skills, and career paths in fisheries. A complete description of each workshop is available on-line (http://www.sdafs.org/meetings/2011/workshops.html). Please pre-register for the workshops. Abstracts can be emailed directly to David Kerstetter, dwkerstetter@gmail.com, please see the meetings website for further details for abstract submission.

The 2011 SDAFS Spring Meeting, "Fisheries connectivity: headwaters to oceans" will provide a platform for fisheries biologists from mountain streams to open seas to meet and discuss patterns of diversity, similarities in demography, behavior, and species specific adaptations for survival in these habitats.

Just as a reminder, the FL chapter 2011 meeting will not be held, so be sure to make plans for the SDAFS in January 2011.

Linda Lombardi
FL AFS President



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Upcoming Events

January 13 – 16, 2011: Southern Division AFS Spring Meeting. Tampa, Florida. www.sdafs.org/meetings/2011/default.htm

Check out our Parent Society's calendar at http://www.fisheries.org/afs/calendar.html for other events not listed here!

New Titles

Community Ecology of Stream Fishes: Concepts, Approaches, and Techniques. Keith B. Gido and Donald A. Jackson, editors. 664 pages. Published by the American Fisheries Society. August 2010.

New AFS Software

FishBC, Version 3.0.1. A computer program that computes back-calculated lengths using the traditional Lee method, and age-length keys from fish bony structures.

FAMS, Version 1.0. Fisheries Analysis and Modeling Simulator (FAMS) is designed to simulate and evaluate the dynamics of exploited fish populations.

Slipke's Fish Aging Tools (S-FAT). An add-on software package designed to extend the utility of Fishery Analysis and Simulation Tools (FAST).

Interested in contributing something to the Shellcracker? Email Kevin Johnson at *kevin.johnson@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 31th, 2010, so start fishing...

Feature Article

Comparison of Two Stocking Techniques on the Survivability of Hatchery-reared Fingerling Florida Largemouth Bass

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Introduction

Sportfish stocking is one of the most well known and commonly used management tools by state conservation agencies for population enhancement. The stocking of warm-water fishes has occurred for over a century, with largemouth bass *Micropterus salmoides* being the most widely stocked of these species in the United States (Smith and Reeves 1986). Reasons for stocking largemouth bass are many, including supplementing populations (Hoxmeier and Wahl 2002; Mesing et al. 2008), responding to angler demand (Buynak et al. 1999), and genetic manipulation (Maceina at al. 1988; Buckmeier et al. 2005). Stocking black bass *Micropterus spp.* as fry and small fingerlings to supplement natural production has rarely been effective, resulting in poor survival and a marginal net effect on the ultimate population biomass (Radonski and Martin 1986) and has been questioned for some time (Meehean 1948). However, the stocking of largemouth bass remains a common management practice, where success of these stockings has been highly variable, and low in general (Loska 1982; Stone and Modde 1982; Boxrucker 1985; Terre et al. 1995; Buckmeier and Betsill 2002; Jackson et al. 2002; Neal et al. 2002; Porak et al. 2002; Hoffman and Bettoli 2005; Mesing et al. 2008; Diana and Wahl 2009).

Based on the stocking objectives, various strategies have been implemented to increase largemouth bass stocking success, such as timing (Neal et al. 2002, Mesing et al. 2008), size (Diana and Wahl 2009), and stocking rate (Buckmeier et al. 2003). An additional variable, site-specific stocking density, has received less attention. Some studies have reported site-specific stocking information, where numbers of fish stocked per site have ranged between 30 and 75,000 (Buckmeier and Betsill 2002; Heidinger and Brooks 2002; Hoxmeier and Wahl 2002; Jackson et al. 2002; Hoffman and Bettoli 2005). Jackson et al. (2002) stocked 30 fish per site at 53 sites in a North Carolina reservoir, while Hoffman and Bettoli (2005) stocked between 15,000 and 75,000 fish per site in a Tennessee reservoir. Colvin et al. (2008) reported that stocked fish were distributed “a few fish at a time” throughout backwater areas in the Arkansas River. However, most of the largemouth bass stocking literature has reported stocking rates as number of fish per total water body area (Loska 1982; Boxrucker 1986; Buynak and Mitchell 1999; Diana and Wahl 2009) and do not describe how the fish were stocked (i.e. single site vs. multiple sites). In Florida, fish stockings have occurred at convenient areas, such as boat ramps (Wes Porak, Florida Fish and Wildlife Conservation Commission, Personal Communication).

Stocking large numbers of fish at a single site results in a temporary clumped distribution, which may promote predation on stocked fish (Hoffman and Bettoli 2005) and increase resource competition, resulting in reduced survival (Jackson et al. 2002). To reduce these initial stocking challenges, another option is to scatter stocked fish over a larger area, which may reduce intraspecific competition and mortality from predation among stocked fish, and increase survival. We have not found any published studies that have directly compared stocking fish at a single site versus distributing fish over larger areas. Therefore, our objective was to assess and compare the survivability of fingerling Florida largemouth bass *Micropterus salmoides floridanus* between two different stocking techniques (clumped stocking vs. scattered stocking). Increasing the survival of stocked fish is a critical component, and thus this study was aimed at providing fisheries managers a potential tool which could help the efficiency and effectiveness of future largemouth bass stock enhancement practices.

Methods

Study areas.—Blue Cypress Lake is a 2,759 ha, eutrophic, central Florida lake located in Indian River County. The mean depth of the lake is 2.3 m with an average littoral zone width of 47 m which is dominated by alligator-weed *Alternanthera philoxeiroides*, water lettuce *Pistia stratiotes*, and bald cypress *Taxodium distichum* (LAKEWATCH 2005). Wildcat Lake is a 142 ha, oligotrophic, central Florida lake located in Lake County. The mean depth of the lake is 4.5 m with an average littoral zone width of 13 m which is dominated by maidencane *Panicum hemitomon*, sawgrass *Cladium jamaicense*, and buttonbush *Cephalanthus occidentalis* (LAKEWATCH 2007).

Hatchery.—Largemouth bass fry were produced intensively by natural reproduction in concrete raceways at the Florida Fish and Wildlife Conservation Commission's Florida Bass Conservation Center in Webster. Brood fish were separated into stocks, where the offspring from each brood stock group were kept separate and were genetically identifiable to their respective brood stock origin following the methods of Tringali (2006). Six to eight days post-hatching, fry were transported to earthen nursery ponds for 28-35 d and allowed to feed on zooplankton. When fry reached 25-35 mm, they were harvested and brought back into the hatchery to feed on artificial diets until the week before stocking, upon which they were fed mosquito fish *Gambusia spp*. Offspring for lakes Blue Cypress and Wildcat were composed of three different brood stocks (Stock 1 - Blue Cypress clumped, Wildcat scattered; Stock 2 – Wildcat clumped; Stock 3 - Blue Cypress scattered).

Stocking.—We stocked 83,550 fish (30 fish/ha) in Blue Cypress Lake on 28-29 April 2008, and 17,040 (120 fish/ha) in Wildcat Lake on 5 May 2008 (Table 1). All transportation tanks containing hatchery fish were tempered with lake water prior to stocking. Within each lake, half of the fish were stocked at a single site (clumped; 42,293 in Blue Cypress Lake and 8,536 in Wildcat Lake), while the other half were scattered along 1.5 km of the littoral zone on the opposite side of the lake (scattered; 41,257 in Blue Cypress Lake and 8,504 in Wildcat Lake) (Figures 1 and 2). Clumped fish were stocked from hauling tank chutes directly into the lake (i.e. boat ramp at Wildcat Lake), while fish for the scattered stocking were loaded into aerated hauling boxes and transported to the scatter area by boat, where fish were evenly distributed along the littoral zone with dip nets. The shoreline distance from the clumped stocking site to the beginning of the scatter area was a minimum of 7.5 km in Blue Cypress Lake and 1.5 km in Wildcat Lake.

Fish Sampling.—The shoreline of Blue Cypress Lake was divided into 750 m transects (*N* = 33) (Figure 1). Transects were divided between 15 fixed (nine clumped and six scattered) and 18 random transects. The 18 random transects were divided into six blocks where one transect in each block was randomly selected each sampling event. Due to the size of Blue Cypress Lake, 21 transects were selected for each event in order to complete sampling within two days. The selected transects were electrofished for 15 minutes along the littoral zone during each sampling event at Blue Cypress Lake. The shoreline of Wildcat Lake was divided into 500 m transects (*N* = 13), where all transects were electrofished for 10 minutes along the littoral zone during each sampling event (Figure 2). At both lakes the allotment of electrofishing effort for each transect was less than the amount needed to sample the entire distance, and therefore, the starting direction of each transect (i.e. beginning or end) was randomized each sampling event.

At seven days post-stocking, Blue Cypress Lake was sampled at a weekly interval for the first six weeks, biweekly for the following ten weeks, and at four months, six months, and one year (*N* = 14). At Wildcat Lake, we sampled seven days post-stocking twice a week for the first four weeks, weekly for four weeks, biweekly for four weeks, and at three months, six months, and one year (*N* = 17). Data from one of the Blue Cypress Lake sampling events (Tropical Storm Fay) and one of the Wildcat Lake sampling events (missing genetic information) were incomplete, reducing the number of sampling events to 13 and 16, respectively.

We sampled during daylight hours using pulsed DC (120 pps) with Smith-Root 7.5 GPP and 9.0 GPP electrofishers at Blue Cypress Lake (Smith-Root, Inc., Vancouver, Washington). Mean specific conductance in Wildcat Lake was 45 µS/cm (LAKEWATCH 2007), and therefore we used 5.0 GPP electrofishers (Smith-Root, Inc., Vancouver, Washington). All boats were equipped with two booms and one dip netter, and we followed the methods of Burkhardt and Gutreuter (1995) to transfer 3,000 W of power to the fish. Largemouth bass collected (≥ minimum size stocked) were fin clipped and clips were placed in individually labeled vials with 95% ethanol and later processed for genetic determination of hatchery brood stock origin (i.e. clumped or scattered), following the methods of Tringali (2006).

Statistical Analyses.—Fingerling largemouth bass designated for Blue Cypress Lake were measured at the hatchery five days before stocking and fish designated for Wildcat Lake were measured on the day of stocking.
A t-test was used to compare the mean total lengths between the clumped and scattered cohorts within each lake.

A Satterthwaite adjustment was made for the Wildcat Lake comparison due to unequal variance. Approximately half (47%, $N = 3{,}996$) of the clumped cohort in Wildcat Lake started feed training at the hatchery one month after the remaining cohort. It was a concern that the later feed-trained fish would be of smaller size and could potentially affect survival estimates for the entire clumped cohort. Therefore, analysis of variance with a Tukey-Kramer adjustment was used to compare mean total lengths of the early feed-trained clumped cohort, the late feed-trained clumped cohort, and the scattered cohort, where lengths were $\log_{10}$-transformed to adjust for non-normal distribution.

Initial stocking mortality of each cohort was estimated by placing 200 fish from each cohort into four mesh cages (50 fish/cage, 4 cages/cohort) for 72 h on the stocking date, where the cages were 2 m tall, 1.3 m in diameter, with 3.2 mm stretch mesh. Initial stocking mortalities of each cohort within each lake were compared using t-tests.

Catch curves were used to estimate mortality of each genetically marked cohort from the transformed catch ($\ln[N+1]$) of each sampling event on days post-stocking, where one was added due to zero catches during some events. By using catch curves, we assumed constant mortality and catchability within each cohort through time. To account for fish dispersal (Hoffman and Bettoli 2005), and therefore density-dependent catchability (Crecco and Overholtz 1990, Shardlow 1993), sampling events prior to 14 days post-stocking were excluded to reduce the catch bias associated with the initial, high density clumped treatments. The one year post-stocking sampling events were excluded because we assumed a difference in mortality rate and catchability between age-0 and age-1 fish. Therefore, we used the time periods from 14-184 days post-stocking in Blue Cypress Lake and 14-203 days post-stocking in Wildcat Lake in the analyses. The slopes of the catch curves were used to estimate the instantaneous daily mortality rates (Z) of each cohort, which were compared within each lake using analysis of covariance (ANCOVA). Interval mortality (A) for the time periods above were estimated as $A = 1 - S$, where $S = e^{-(Z \cdot i)}$, and i = number of days in the interval (171 days for Blue Cypress Lake and 190 days for Wildcat Lake) (Miranda and Bettoli 2007). Since fish from the clumped cohort in Blue Cypress Lake were collected in two distinctly different habitat types (narrow, sparsely vegetated canals versus wide, heavily vegetated littoral zone), we were concerned that the catches in these two habitats would differ in catchability (Bayley and Austen 2002) and potentially influence the mortality estimates. Therefore, catch curves were developed for individuals of the clumped cohort caught in canals and for those caught in the remaining littoral zone, and the slopes were compared using the methods described above. The slopes from these two catch curves were not different ($F = 0.54$; df = 1,18; $P = 0.47$), indicating no difference in the instantaneous daily mortality rates. While this comparison does not explain if differences in catchability occurred, it does indicate that combining all catches from the clumped cohort in Blue Cypress Lake will not bias our mortality estimate and one catch curve is suitable for analyses. All statistical analyses (significance at $\alpha < 0.05$) were calculated and compared using Statistical Analysis Software (SAS 2002).

Results

The mean total length (MTL) of clumped and scattered fish stocked into Blue Cypress Lake was 57 mm (SD = 6.5; N = 10) and 60 mm (SD = 5.0; N = 10), respectively, and were not significantly different (t-test: $t = 1.35$; df = 18; $P = 0.19$). At Wildcat Lake, the MTL of clumped and scattered fish was 69 mm (SD = 12; N = 200) and 76 mm (SD = 7.0; N = 200), respectively, and were significantly different ($t = 7.10$; df = 317; $P < 0.0001$). The MTL of the late feed-trained clumped cohort (MTL = 55; SD = 6.12; N = 67), the early feed-trained clumped cohort (MTL = 76 mm; SD = 8.13; N = 133), and the scattered cohort were significantly different (ANOVA: $F = 281$; df = 2, 397; $P < 0.0001$) at Wildcat Lake. Differences occurred due to smaller MTL of the late feed-trained clumped cohort compared to the early feed-trained clumped cohort and the scattered cohort (Tukey-Kramer: Both $P < 0.0001$), whereas there was no difference between the early feed-trained clumped cohort and the scattered cohort ($P = 0.92$).

Mean initial stocking mortality at Blue Cypress Lake was 31% (SD = 14) for the clumped cohort and 13% (SD = 4.8) for the scattered cohort, and was significantly different ($t = 2.45$; df = 6; $P = 0.0498$) (Table 2). Mean stocking mortality at Wildcat Lake was not different between the two cohorts (Clumped: 12%, SD = 7.4; Scattered: 11%, SD = 4.4 [$t = 0.23$; df = 6; $P = 0.82$]).

In all sampling events at lakes Blue Cypress and Wildcat we recaptured 0.51% and 1.23% of the Florida largemouth bass stocked in each lake, respectively (Table 3). We recaptured 389 (0.92%) individuals from the clumped cohort and 37 (0.09%) from the scattered cohort at Blue Cypress Lake. At Wildcat Lake, we recaptured 99 (1.16%) individuals from the clumped cohort and 111 (1.31%) from the scattered cohort.

The ANCOVA comparison between the clumped and scattered catch curve slopes for Blue Cypress Lake resulted in a significant difference ($F = 5.83$; df = 1, 18; $P = 0.0267$), indicating that the instantaneous daily mortality rate of the clumped cohort (Z = 0.0157; regression $r^2 = 0.78$) was higher than for the scattered cohort (Z = 0.0044; $r^2 = 0.13$) (Figure 3).

The catch curve slopes resulted in estimates of 93% interval mortality (*A*) for the clumped cohort and 53% for the scattered cohort from 14 days to approximately six months post-stocking. However, for Wildcat Lake, the catch curve slopes for the clumped (Z = 0.0078; $r^2 = 0.35$) and scattered (Z = 0.0087; $r^2 = 0.44$) cohorts were not different ($F = 0.04$; df = 1, 18; $P = 0.84$) and interval mortalities were 77% and 81%, respectively (Figure 3).

Discussion

Increased mortality of the scattered cohorts was a concern due to additional handling; however, fish in the clumped cohort cages at Blue Cypress Lake experienced the greatest amount of initial stocking mortality, while mortality among the remaining cohorts at both lakes was fairly homogenous. At both lakes, the water temperature was 25°C at the time of stocking and all hauling tanks were tempered with lake water prior to stocking, and therefore we do not think lake temperature caused the difference. The clumped cohort cages in Blue Cypress Lake were exposed to relatively high wind and wave action compared to the other cages, which likely caused the increased mortality. This may have resulted in overestimated stocking mortality estimates for this cohort, if the remaining fish not in cages found refuge from the wave action. However, we had no way of testing this and do not know if these mortality estimates translated to the population.

Interval mortality estimates for the stocked cohorts in Blue Cypress Lake indicated that survival of the scattered fish was higher than for the clumped fish. In Wildcat Lake however, there was no difference in survival between the two cohorts. Buckmeier and Betsill (2002) and Jackson et al. (2002) reported daily mortality rates over approximately the same time interval as our study, although the size of largemouth bass stocked in those studies was smaller (mean ≈ 40 mm). Buckmeier and Betsill (2002) reported mortality estimates of 2.33% (high-catch stocked coves) and 2.48%/day (low-catch stocked coves) from 6-150 days post-stocking in a Texas reservoir, where largemouth bass were stocked at a rate of 3,500 fish/site (9 sites). Jackson et al. (2002) reported mortality estimates of 0.4% and 0.5%/day between July and October for two consecutive years of stocking in a North Carolina reservoir, where fish were stocked at a rate of 30 fish/site (53 sites). Our mortality estimates, in general, were similar to Jackson et al. (2002) (Blue Cypress Lake: Clumped – 1.56%/day, Scattered – 0.44%/day; Wildcat Lake: Clumped – 0.78%/day, Scattered – 0.87%/day).

Our mortality estimates were developed through the use of catch curves, and therefore, we assumed that mortality and catchability were constant within each cohort though time. If mortality and catchability were constant within each cohort though time, then our catches are a true representation of abundance and mortality. If they were not constant through time, then our estimates are most likely biased. Catchability has been shown to be affected by many variables, such as density (Peterman and Steer 1981; Crecco and Overholtz 1990; Shardlow 1993), habitat (Danzmann et al. 1991; Bayley and Austen 2002), and fish size (Bayley and Austen 2002; Hense et al. 2010). Due to the clumped stocking treatments, we attempted to reduce the density bias by removing our sampling events prior to 14 days post-stocking to account for fish dispersal. While habitat in Wildcat Lake was homogenous, it was not in Blue Cypress Lake, and thus we attempted to account for the habitat bias in the clumped cohort catches in Blue Cypress Lake by comparing the catch curve mortality estimates from the canal and non-canal catches, as discussed in the methods. Relative to fish size, there were two potential biases associated with our catches; 1) significantly smaller fish comprising half of the clumped cohort in Wildcat Lake, and 2) a change in fish size through time. The difference in MTL between the clumped and scattered cohorts in Wildcat Lake was due to a smaller MTL of nearly one-half of the clumped fish. While we assumed constant catchability and mortality within each cohort through time (Miranda and Bettoli 2007), the difference in size at stocking may have influenced the study results if mortality was higher and catchability was lower for the smaller fish contributing to the clumped cohort in Wildcat Lake. However, we have no way to assess if a difference of this magnitude had any effect on estimated mortality for this cohort. Relative to changes in fish size through time, if catchability did increase throughout our sampling, where larger individuals were captured more efficiently, our mortality estimates may be underestimated for the time intervals we evaluated.

Our sampling was focused during the early time period after stocking took place and a lot of time and resources were allocated due to this sampling regime, which may have been unnecessary. Based on our results and the uncertainty surrounding them, we feel that fewer, more intensive sampling events that incorporate estimates of catchability, and thus abundance, could provide improved estimates of stocked fish mortality. Obtaining unbiased estimates of abundance would allow for the valid discernment of trends through time (e.g. mortality estimates), which can be approached through estimates of catchability (Bayley and Austen 2002).

We feel our study could have benefited from catchability estimates through time to correct for the variables described above, and suggest that future research explore this important metric, especially if catch curves are the means to estimate mortality.

The objective of our study was to assess and compare the survivability of fingerling Florida largemouth bass between two different stocking techniques with the goal of potentially providing fisheries managers a method to improve stocking success. As with many multi-system stocking studies (Hoxmeier and Wahl 2002; Isermann et al. 2002; Porak et al. 2002), our results varied between lakes. Scattering fish is associated with additional time and resources, where the cost will need to be compared to the benefit. The additional cost of scattering fish will vary depending on several factors; biologists' time, truck and boat use, and fuel. Scattered cohort survival was significantly greater than that of the clumped cohort at Blue Cypress Lake; however, results from Wildcat Lake indicate that further work is needed in order to better inform the future decisions of fisheries managers on whether or not to scatter stocked fish.

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Table 1. Florida largemouth bass stocking information for lakes Blue Cypress and Wildcat, Florida.

Lake	Surface area (ha)	Date stocked	No. bass stocked	Mean TL mm (SD)	No. bass/ha stocked
Blue Cypress	2,759	28-29 April 2008	83,550	60 (6)[a]	30
Wildcat	142	5 May 2008	17,040	73 (11)[b]	120

[a] Measurements taken five days pre-stocking
[b] Measurements taken on stocking date

Table 2.—Percent stocking mortality (72 h) of Florida largemouth bass in cages for each stocking treatment in lakes Blue Cypress and Wildcat, Florida. Means (SD) of each cohort cage group are italicized at bottom.

Blue Cypress		Wildcat	
Clumped	Scattered	Clumped	Scattered
18	6	2	6
24	14	12	8
32	16	12	12
50	16	20	16
31 (14)[A]	*13 (4.8)*[B]	*12 (7.4)*[A]	*11 (4.4)*[A]

[A, B] Differing letters indicate a significantly different ($P < 0.05$) mean within a lake.

Table 3.—Total recaptures of stocked Florida largemouth bass in lakes Blue Cypress and Wildcat, Florida, collected in all sampling events during 2008 and 2009.

Cohort	Number of recaptures	Total Stocked	% Recapture
Wildcat Clumped	99	8,536	1.16
Wildcat Scattered	111	8,504	1.31
Total	210	17,040	1.23
Blue Cypress Clumped	389	42,293	0.92
Blue Cypress Scattered	37	41,257	0.09
Total	426	83,550	0.51

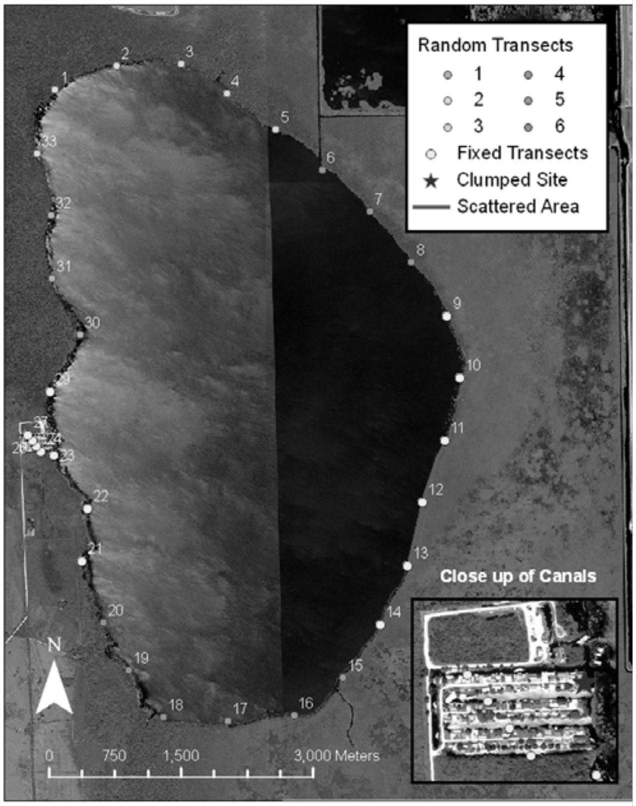


Figure 1.—Florida largemouth bass clumped stocking site, scattered stocking area, and sampling transects located at Blue Cypress Lake, Florida.

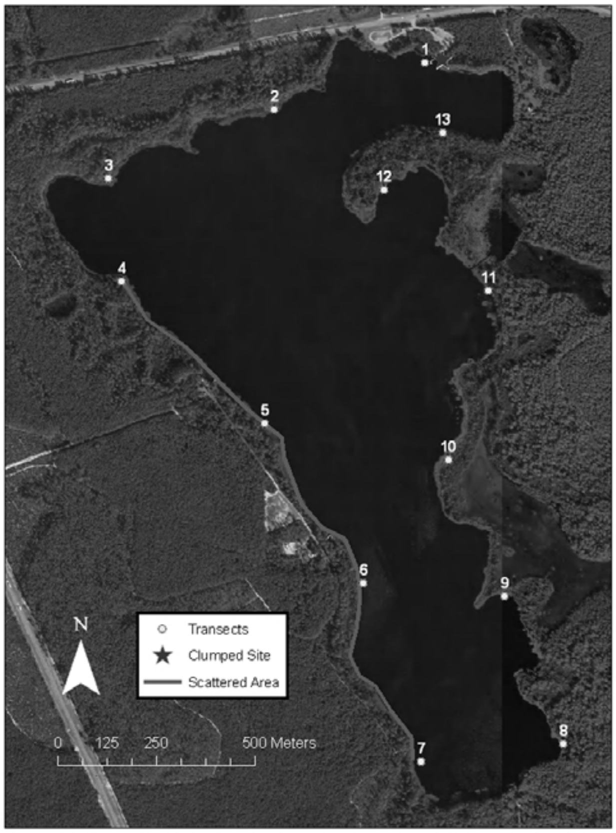


Figure 2.—Florida largemouth bass clumped stocking site, scattered stocking area, and sampling transects located at Wildcat Lake, Florida.

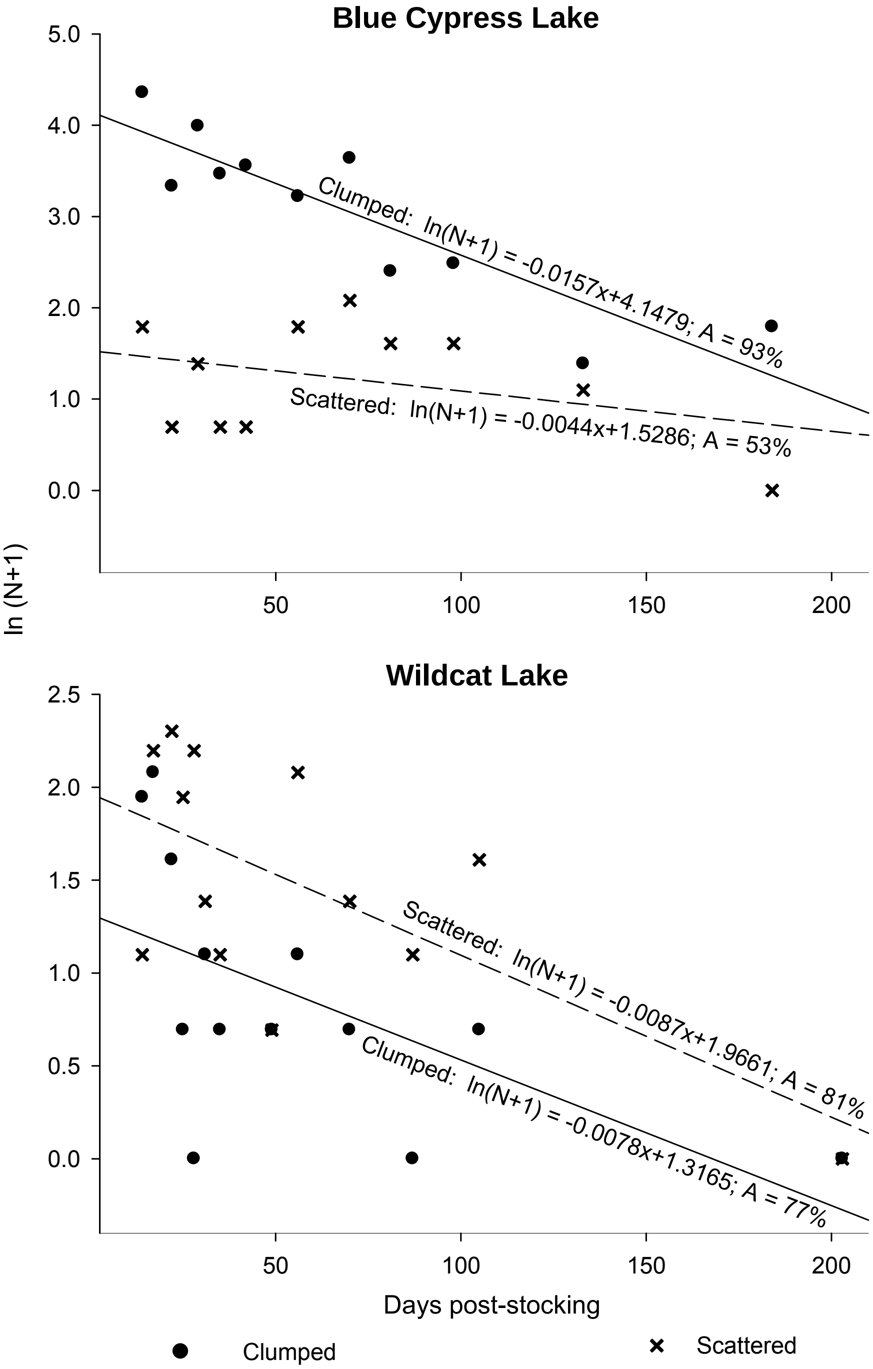
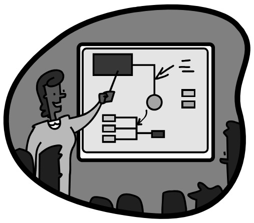


Figure 3.—Transformed catch, ln(N + 1), of Florida largemouth bass regressed on days post-stocking for clumped and scattered cohorts stocked into lakes Blue Cypress and Wildcat, Florida, in 2008.



2011 Southern Division AFS Spring Meeting
Grand Hyatt Tampa Bay
January 13-16, 2011 Tampa, Florida

We hope you are planning on attending the 19th annual SDAFS Spring Meeting that we (the Florida Chapter) are co-hosting at the beautiful waterside Grand Hyatt Tampa Bay. The room rate (single or double) is $139.00. Details regarding accommodations, reservations, meeting registration, call for papers, workshops, symposia and student information are available at the Division's meetings website (**http://www.sdafs.org/meetings/2011/default.htm**). This meeting promises to once again be an effective forum for the exchange of ideas, presentation of research papers (completed and in progress), to conduct technical committee and Division business, and other professional interactions.

The general schedule for the upcoming Spring Meeting will be similar to past years, and is as follows: Thursday - Technical Committee meetings; Friday - EXCOM and continuing education workshops; and Saturday and Sunday morning - Technical Sessions, Symposia, and Poster presentations.

SECOND CALL FOR CONTRIBUTED PAPERS

Individuals desiring to present research and management results and/or progress of ongoing work should submit abstracts to the **Program Chair; DUE DATE: 12 NOVEMBER 2010.** Technical presentations will be scheduled for 20 minutes – 15 minutes for the presentation followed by a 5-minute question/answer period. Moderators will strictly enforce the time limit. PowerPoint presentations are required.

Poster presentations will be encouraged due to the number of attendees at the meeting. Posters should be no larger than 150 X 100 cm (60" X 40"), portrait or landscape format. Posters will be exhibited throughout the meeting duration, and poster authors will be available at specific, scheduled times to talk about their work and answer questions. **Abstracts, either for presentation or poster, should be submitted to the Program Chair using the e-mail address,** dwkerstetter@gmail.com **– please note that there will not be an online submission form for this meeting. Submissions will be confirmed via a return e-mail within 48 hours.**

Please state during submission whether the abstract is for a poster or for a presentation. Abstract submission should include the paper's title, author names and addresses (include phone, fax and e-mail if available), and text. It is assumed that the first author listed will be the presenter unless otherwise noted. Students intending to compete for the "Student Best Paper Award" should indicate so during submission. The text should be no more than 300 words. Be sure to state the study objectives, principal results, and conclusions within the abstract. If the principal contact person for correspondence regarding the abstract is someone other than the presenter, please specify. Any questions regarding presentations and abstract submission should be submitted to David Kerstetter, Program Committee Chair (dwkerstetter@gmail.com).

Abstract Format (MS WORD is preferred):

Presenter: Schaub, M.; Email: MattSchaub@HoustanTexans

Author(s): Schaub, M.[1], S. Moore[2], and D. Majikowski[3]
[1]Affiliation and address
[2]Affiliation and address
[3]Affiliation and address

Title: The Sometimes Rocky Road of a University of Virginia Quarterback
Abstract: You know how this works.
≤ 300 words (MS Word will count it for you!)

Student Presentation: no (versus yes, work reported was completed while still a student).

Presentation type: oral (versus poster)

Meeting Fundraising, Sponsorship & Raffle!

Wes Porak, with the help of others, have been hard at work soliciting funds from potential meeting sponsors with the goal of raising $40,000. Fundraising is one of the most important parts of meeting planning, so if you know of potential sponsors or would like to get involved with the solicitation of funds, please contact **Wes Porak** (**wes.porak@myfwc.com**).

If you are also interested in soliciting goods for the raffle, please contact **Andy Strickland** (**andy.strickland@myfwc.com**).

Students:

The Florida Chapter Student Travel Grants for the 2011 meeting will only cover the costs of early student registration ($85.00). Students need to **register by December 3, 2010** to be illegible for the travel grant. In addition, the Southern Division of AFS Student Affairs will have a limited number of complimentary student rooms available. Students need to follow the guidelines provided by John Jackson (SDAFS student affairs coordinator) on the meeting's website http://www.sdafs.org/meetings/2011/students.html.

Master's and doctoral students are also eligible for the Roger Rottmann Memorial Scholarship, for which the recipient(s) will be announced at the meeting. More information and the application materials are available at http://www.sdafs.org/flafs/awards.html. **Application deadline is December 17, 2010.**

Polychlorinated biphenyls in red snapper, *Lutjanus campechanus*, off the coast of Pensacola, Florida

Heather Moncrief
University of West Florida Fisheries Lab

Currently, the University of West Florida Fisheries Lab is conducting research to determine concentrations of polychlorinated biphenyls (PCBs) in red snapper, *Lutjanus campechanus*, off the coast of Pensacola, Florida. In the 1960s there was a leak of heat-exchange fluid from the Monsanto Chemical Company into the Escambia River, resulting in the contamination of Escambia River, Escambia Bay, and Pensacola Bay ecosystems (Duke et al. 1970; Snyder et al. 2007). In addition to the Monsanto leak, there is concern over point-source contamination at the *ex-Oriskany* site due to the presence of solid PCBs on the ship at the time of sinking (Snyder et al. 2007).

The goal of our research is to determine the levels of PCBs found in offshore reef environments, as well as to determine if they have the ability to bioaccumulate. This will be evaluated by collecting twenty specimens within different size classes and looking at PCB concentrations and stable isotope ratios. Specimens will be collected using hook and line gear primarily in the proximity of the *ex-Oriskany* site since there is concern of additional PCB leakage from this air craft carrier, and therefore preliminary data is available (Snyder et al. 2007).

Once specimens are brought onto the boat, they will be handled using powder-free latex gloves and sterile techniques will be implemented between samples. Two hundred grams of skinless tissue will be removed from below the first dorsal fin, and this will then be immediately wrapped in aluminum foil and placed into a Ziploc bag with internal and external labels, before being placed <4°C until analysis (Snyder et al. 2007). In addition to removal of tissue, otoliths will be removed so that aging of the specimens can occur. Since red snapper feed at different trophic levels throughout life, knowing the age of individual fish may support differences seen in PCB concentrations among samples, as well as provide information regarding bioaccumulation.

Analysis of tissues for PCB concentration will follow US EPA Method 1668B, which is the standard procedure for analyzing tissues for this pollutant. It is also the primary method of analysis for determining risks for human consumption in regards to PCB contamination. In addition to analyzing tissues for PCBs, stable isotope analysis will be conducted. This analysis will allow us to look at which trophic level the fish are feeding, as well as if they are feeding on benthic or pelagic prey.

The issue of contamination in reef fish is especially important along the coast of the Gulf of Mexico since these fishes are highly targeted by commercial and recreational fishermen. It is anticipated that this study will provide information on translocation of PCBs from estuaries and bays to offshore reef environments, supported by PCBs being present in fish that do not enter estuaries and bays where high levels are found. It is also expected to provide data supporting the bioaccumulation of PCBs in fish tissue, which will be supported by increased levels in larger, older fish.

References

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