The Shellcracker

FLORIDA CHAPTER OF THE AMERICAN FISHERIES SOCIETY

https://units.fisheries.org/fl/

January 2021

President's Message:

Welcome to 2021!

Hopefully, you are still comfortable, gainfully employed, and grateful. I don't recall ever feeling that the year could be so "make or break". Running with that, I'm challenging you to make it the best that you can for both yourself and others. We're in the same boat. And, yes, last year it took on some water. OK, lots of water. Water that weighed more than we thought. And yet, here we are, still floating, didn't sink, didn't drift too far off course. Time to crank up the engines and get back on the fish, it's what we do.

Whoa, wait, before you go charging off over the horizon to tomorrows promising fishing grounds.

That safety net that you take for granted has been shifted out from under you. Those of you virtually working should be OK at least during work hours. I'm talking about the riskier part of your job and risks you take for recreation. Yes, this is yet another facet of your life that has been greatly affected and indeed, compromised. The healthcare system has been and continues to be overwhelmed. Your local emergency room and walk-in clinic are included and now may likely turn you away with non-threatening (though very real and painful) injuries. My friend ended up going to a pharmacist for a DIY (read butterfly strips instead of sutures) first aid after a bloody tangle with an electric hedge trimmer. So, yes, take it slower, be more methodical, mindful. And hold off on that risky behavior (jumping bonfires) until things get a bit better.

Thanks,

Bob Heagey
Florida Chapter President

Getting in Touch

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Upcoming Events

March 5, 2021: Abstract Deadline for Florida Chapter AFS: Virtual Annual Meeting

March 1, 2021: Florida Chapter Award Nomination Deadline

April 6–9, 2021: Southern Division AFS Virtual Annual Meeting.

April 20–22, 2021: Florida Chapter AFS Virtual Annual Meeting.

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 March 15th, 2021, so start fishing...

Featured Article

The Curious Distribution of the Blackbanded Sunfish in Florida

Jason O'Connor, Chris Anderson, and Travis Tuten
Florida Fish and Wildlife Conservation Commission, FWRI
Gainesville Freshwater Fisheries Research Office

"In the course of sampling fish populations in various lakes and streams in central Florida during the past few years, I have been strongly impressed by the curiously restricted habitat distribution of the small black-banded centrarchid *Mesogonistius chaetodon elizabethae* [*Enneacanthus chaetodon*]*"* – George Reid, 1950

For over 70 years, the unusually restricted distribution of Blackbanded Sunfish *Enneacanthus chaetodon* has intrigued and confounded ichthyologists. These small (max size = 3 ¼ inches), attractive centrarchids are sporadically distributed from New Jersey to Florida (Figure 1). Based on known current localities, Blackbanded Sunfish populations appear most secure in North and South Carolina. Historical populations in Pennsylvania and Delaware are believed extirpated, and collection records in Georgia and Florida are sparse and apparently suitable habitats in proximity to known locations are often unoccupied (Figure 2).

Figure 1. Top: Juvenile Blackbanded Sunfish. Bottom: Adult Blackbanded Sunfish.

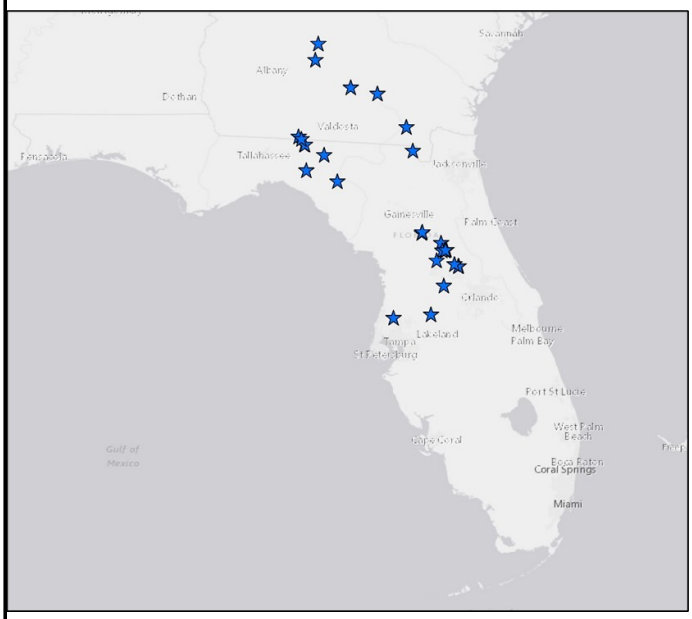


Figure 2. Historical collection localities of Blackbanded Sunfish throughout Florida and south Georgia.

In Florida, Blackbanded Sunfish were first collected from Mill Dam Lake in the Ocala National Forest in the 1940s. Blackbanded Sunfish were known exclusively from the Ocklawaha drainage until a couple populations were discovered in the Aucilla drainage in the 1960s and 70s. A single collection from Green Swamp in 1989 represents the only known occurrence in the Withlacoochee drainage. A targeted survey of all historical localities in Florida conducted between 2002-2004 failed detect a single individual (Tate and Walsh 2005), and Blackbanded Sunfish were widely believed to be extirpated from the state until a collection was made at Lake Rachel in the Aucilla drainage in 2009.

Featured Article

Despite their apparent rarity, Blackbanded Sunfish are not afforded any protections under the state's imperiled species program. In order to assess whether state-listing is warranted for this species, more comprehensive information on the current status of Blackbanded Sunfish is needed. In 2015, we began surveying for Blackbanded Sunfish to provide data that would inform a biological status review for the species. Our main objective was to identify all current populations of Blackbanded Sunfish throughout the state. To achieve this objective, we attempted to survey all known historical localities and additional potentially suitable locations within historically occupied drainages. In addition, we have conducted repeat surveys at sites with positive detections to provide information on temporal variation in detectability.

Historical sites were identified using museum records and additional sites were selected using satellite imagery to evaluate the hydroperiod and vegetation coverage of potential sites. Sites were prioritized if they were near a known historical location, had a high aquatic vegetation coverage, and appeared to hold water during times of drought. Sites were sampled using a combination of methods, including seining, dip-netting, electrofishing, and fyke-netting, though most samples were collected via seine. We measured a few potential habitat covariates at each site, including but not limited to water pH, conductance, and aquatic vegetation composition (Figure 3).

Figure 3. Biologist measuring water quality parameters at a small pond with high aquatic vegetation coverage, which is typical for waterbodies where Blackbanded Sunfish have been collected.

Between 2015 and 2020, we surveyed 100 unique sites, including 14 historical locations. We collected Blackbanded Sunfish at 5 total locations, only one of which (Lake Rachel) was a previously known location. We were unable to detect Blackbanded Sunfish at any pre-2009 collection location. Catch rates ranged from 9.5 individuals/seine haul at Lake Rachel to 0.125 individuals per seine haul at Parramore Prairie. pH at occupied sites ranged from 3.6 to 6.0, and specific conductance ranged from 24 to 40 µS/cm. The limited number of detection locations precludes statistical comparison of habitat differences at occupied and unoccupied sites.

The collections at Parramore Prairie in 2015 were the first individuals collected in the Ocala National Forest since the 1970s. Additionally, the collection made at Sampala Lake in Madison County is only the second record of Blackbanded Sunfish in the Econfina drainage. The discovery of these populations suggests that there are likely more currently unknown populations. However, given that Blackbanded Sunfish were detected at only 5% of potentially suitable sites surveyed during this study, identifying additional new locations will likely require significant targeted effort.

The inability to collect Blackbanded Sunfish at historical localities suggests a possible population decline within Florida, but this interpretation is confounded by several factors. First, our understanding of the historical distribution of Blackbanded Sunfish is based primarily on a sparse record of museum collections. Indeed, part of the reason that these historical collections are sparse is likely because the species has always been rare throughout the state. If Blackbanded Sunfish were rare historically, is the apparent rarity in recent collections indicative of decline or simply a reflection of a normal ecological state for the species?

Second, museum records provide little information on relative abundance or detectability. Do the historical records reflect chance encounters at a few locations of a poorly detected but widely distributed species, or are historical records an accurate reflection of a well-detected but narrowly distributed species? If we assume that detectability of the species is high, then we can be relatively confident that historical records accurately reflect the historical distribution of the species, and that recent non-detections represent true extirpations at these historical locations. However, even though the detection rate was relatively high in this study (71%), we believe it is unsafe to make this assumption. It is likely that detectability varies among waterbodies, and may be influenced by sampling gear, local population density and habitat composition. Our observed detection rate is highly dependent on a small number of sites (5). If the sites where we caught Blackbanded Sunfish during this project support unusually dense populations, then the resulting detection estimates will be biased high. Furthermore, our detection estimates may not be generalizable to sites with habitat structure that differs from that at the 5 collection sites.

Despite the questions regarding detectability, it is safe to say that state-wide, high-density Blackbanded Sunfish populations are indeed rare. Given that there are only 5 currently known populations, effort should be taken to ensure that suitable habitat is maintained in these locations. Additionally, future research on annual variation in population density at high quality sites, and the relationship between population density and detectability, would help inform future efforts to conserve this species in Florida.

American Fisheries Society
Florida Chapter

Virtual Annual Meeting
April 20-22, 2021

We have shifted the 2021 annual meeting to a virtual platform. The platform and link is yet to be determined. The chapter officers are working hard on the logistics of this meeting and will continue to update the chapter as information becomes available. Below you will find the current information. Please stay tuned for further details.

Cost: 2021 Chapter Dues ($10), no additional cost for meeting or continuing education workshop

Symposium: "Schooling for Successful Science" We all know that there are many fish species that exhibit schooling behavior for the betterment of their species. Whether it is to increase foraging success or escape those that are foraging on them, schooling is a behavior observed by both freshwater and marine species. As fisheries scientists, "schooling" amongst ourselves can help us meet our goals and objectives as well. Two of the most important aspects we can learn from schooling as scientists are learn from what was historically done and learn from those currently around us. In this year's symposium, I want to focus on how we got to where we are today. I want to focus on how we have learned from historical, potentially long-term data sets, and better fisheries science through communication and collaboration with those around us. This learning can take place either within our species (internal collaboration) or outside (external collaboration) but should focus on the implementation of an objective towards the advancement of fisheries science. Examples of topics relevant to the symposium would be: the various research projects done on rearing and stocking techniques for Largemouth Bass that can inform our freshwater hatcheries on developing more successful stocking techniques or marine fisheries independent monitoring that provides recruitment data on inshore species for regulation changes. Joint talks between collaborators are welcomed, but not necessary. I truly believe that understanding and sharing the stories to our present day will aid us in becoming better scientists and advancing Florida fisheries further ahead with our help.

Deadlines: Abstracts – March 5th, 2021
Registration – April 22nd, 2021 by 9:00am **Registration Required**, Register here

Tentative Meeting Schedule:

Oral Presentations – 1000 to 1400 each day (40 minute lunch break)
Poster Session – 1430 to 1530 on Tuesday, April 20th
Business Meeting – 1430 to 1600 on Wednesday, April 21st

Presentation Formats: Similar to 2020 AFS Virtual Spring Conference

Oral Presentations – Pre-recorded videos with speaker on live for questions (15 minute presentations with 5 minutes for questions)
Poster Presentations – Posters will be uploaded to a shared drive for all registrants to access, poster presenters will be live in their own "breakout session" to answer questions

*If you haven't previously recorded a presentation, please see the following link: How to Record Presentations using PowerPoint. Pre-recorded presentations will be uploaded to a Google Drive folder prior the meeting (Link to folder will be distributed to presenters in April).

Continuing Education Workshop: Collecting, Processing, and Ageing Fin Structures From Freshwater and Marine Fishes (See page 9 for details)

Opportunities for Student Support: Student "travel" grants will be available for the virtual annual meeting; however, since the meeting is virtual, students who receive the "travel" grants, present (oral or poster) at the meeting and submit a blog post for the Student Subunit's blog Reefs to Rivers will be entered into a raffle for $100! Master's and doctoral students are also eligible for the Roger Rottmann Memorial Scholarship, for which the recipient(s) will be announced at the annual meeting. More information and the application materials are available on the chapter's website at https://units.fisheries.org/fl/awards-and-scholarships/.

2nd Call for Oral & Poster Presentations!

Abstract Submission

Please submit your abstract as a MS Word document to Daniel Nelson. Please follow these instructions for submission:

- In the email subject line, please enter FLAFS 2021: followed by the author names in your abstract (e.g., FLAFS2021 SmithTaylorRosen)
- Use the same name for the abstract file, e.g., FLAFS2021 SmithTaylorRosen.doc
- Please include the associated information requested above with the abstract
- ***NEW**:* Please submit 1-3 "action shots"/pictures (jpg format <500 KB in size) associated with your research for the FL Chapter website with your abstract. Non-presenters may also submit photos to Chris Anderson or Daniel Nelson if they would like to contribute.

Abstract format

Abstract *word limit is 300 words* and should include the following information:

Presenter: Williams, Brian
Email: BrianWilliams@FloridaFish.net
Author(s): Williams, B.[1], K. Rowley[1], and P. George[2]
[1]Affiliation with address.
[2]Affiliation with address.

Title: Recommendations for New Limits on Some of Florida's Most Targeted Fish Species

Abstract: 300 word maximum

Student Presentation: No or Yes (work presented was completed while a student)

Presentation type: Oral or Poster

Would you like to be considered for the symposium? Yes or No

Are you willing to be a judge? Yes or No If so, oral presentation or poster?

Presentation details

Speakers will be given 20 minutes for their pre-recorded talks (15 minutes for presentation and 5 minutes for live Q&A session immediately after video). If you haven't previously recorded a presentation, please see the following link: How to Record Presentations using PowerPoint. Pre-recorded presentations will be uploaded to a Google Drive folder prior the meeting (Link to folder will be distributed to presenters in April)."

All posters will be presented virtually on Tuesday, April 20th
Poster PDFs will be uploaded to a Google Drive folder. Link to the folder will be distributed to presenters in April. Individual breakout sessions will be created for poster presenters where they will be available to answer questions live from 2:30pm to 3:30pm on Tuesday, April 20th.

If you require other options for projection or poster formats, please contact the annual meeting's Program Chair, Daniel Nelson, Daniel.Nelson@myfwc.com.

Award Nominations

The Florida Chapter American Fisheries Society is seeking nominations for the Outstanding Achievement and Rich Cailteux Awards. Our membership is full of dedicated professionals, and it's time to recognize their efforts. Please review the award criteria below and send nominations to Eric Nagid (eric.nagid@myfwc.com) by **March 1st, 2021**. Applications should be limited to one page, but descriptive enough to convey why the individual is deserving of the award.

Outstanding Achievement Award

The purpose of the Outstanding Achievement Award is to recognize individuals for singular accomplishments and contributions to fisheries, aquatic sciences, and the Florida Chapter. The award aims to honor individuals for distinct contributions to the fisheries profession and enhancing the visibility of the Chapter. The Outstanding Achievement Award is the highest honor Florida AFS may bestow upon an individual member or collaborating group.
Candidates will be evaluated according to the following criteria:

- Original techniques or research methodology
- Original ideas, viewpoints, or data which contributed to fisheries management or our understanding of aquatic resources
- Important ecological discoveries
- An original fishery research or management program of statewide importance
- Activities in public education and outreach that have statewide impacts

Rich Cailteux Award

The purpose of the Rich Cailteux Award is to recognize individuals who have maintained a long-term commitment to research, management, and/or conservation of Florida fisheries and aquatic resources. This award aims to honor individuals for their career contributions to the fisheries profession and enhancing the visibility of the Florida Chapter.
Candidates will be evaluated according to the following criteria:

- A minimum of 20 years spent in a fisheries related field in Florida
- Substantial career contributions to Florida aquatic resources and the fisheries profession
- An imaginative and successful program in fisheries and aquatic sciences education
- A history of mentoring young fisheries professionals, and involvement and leadership with the Florida Chapter of the American Fisheries Society

FL AFS Spring 2021 Continuing Education Virtual Workshop

Title: Collecting, Processing, and Ageing Fin Structures from Freshwater and Marine Fishes

Hosts: Summer Lindelien (FWC-FWRI) and Age and Growth Lab (FWC-FWRI)

When: April 14th – 9:00am to 1:00pm

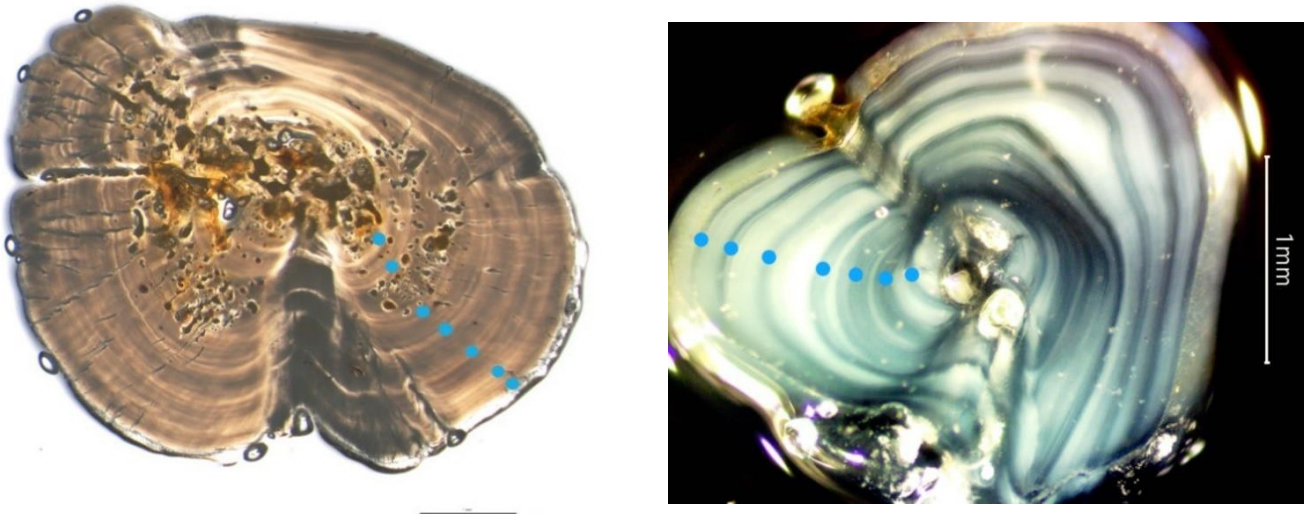
Where: Adobe Connect (Link to be distributed via email on April 12th)

Cost: Free for members who pay their 2021 FL AFS Chapter Dues ($10; Click link to pay dues)

Registration Deadline: April 9th - 5:00pm (Register here; **Registration required**)

Draft Agenda:

- Welcome and Introductions
- Introduction to fish ageing and nonlethal ageing applications
- Removing, storing, and processing nonlethal ageing structures
- Short break
- Interpreting and ageing nonlethal structures, and associated nuances
- Timing of growth zone formation, references sets, and materials list
- Short break
- Group nonlethal ageing exercise
- QA/QC examples
- Discussion and questions



Seven year-old Goliath Grouper dorsal spine section pictured left and seven year-old Florida Bass dorsal spine section pictured right.

Student Subunit Update

By: Lauren Kircher

Student Involvement

We look forward to "seeing" everyone at the FL AFS meeting in April. Keep an eye on our blog (https://flafsstudentsubunit.wordpress.com), Facebook, and Instagram to see how Florida student researchers are keeping busy and still accomplishing a lot.

The student subunit will be offering a travel grant to the Southern Division meeting to offset the costs of registration. Students must be registered members of the Florida Chapter of the American Fisheries Society and be pursuing an undergraduate or graduate degree related to fisheries science at a college in the state of Florida to be eligible. Preference may be given based on other criteria outlined in the application which will be posted on our website.

Sheepshead Shuffle details will be coming out before the meeting. Make sure to register and reserve your spot in the virtual 5K. Don't let the quarantine blues get you feeling down! Stay in touch with other scientists and exercise while raising money for student travel grants to the National and Southern Division meetings.

New Merchandise

The student subunit is offering hats and NEW buffs (UPF50) for sale via the chapter's website. All merchandise goes to support travel grants and the student subunit. Most of our merchandise is sold at the chapter meeting. Don't forget to support students when the meeting goes online! https://units.fisheries.org/fl/chapter-dues/

Get Involved

Are you a student interested in promoting your research or developing your science communication skills? Become a contributor to our blog Reefs to Rivers (https://flafsstudentsubunit.wordpress.com) or send us pictures and have your research featured on our Instagram (www.Instagram.com/flafsstudent)

Contact us at flafsstudent@gmail.com for information on how you can get involved. Don't forget to follow our blog, Instagram, and Facebook (www.Facebook.com/AmericanFisheriesSocietyFlStudentChapter).

Do you use Amazon? By shopping with our Amazon Smile account, https://smile.amazon.com/ch/52-1208319, Amazon donates to FLAFS. Funds go to support student travel awards. Sign up today!

Student Featured Article

Early Larviculture Research for Two Marine Ornamental Fish Species

Grace Sowaske
University of Florida
Fisheries and Aquatic Sciences, M.S Candidate

Grace Sowaske is from Madison, Wisconsin where she received her B.S in Wildlife Ecology from the University of Wisconsin-Madison. After graduation she moved to Florida in her self-built tiny house on wheels and was employed at a marine ornamental aquaculture facility where she fell in love with the culture of marine species. She is now working towards her M.S in Fisheries and Aquatic Sciences at the University of Florida's Tropical Aquaculture Lab in Ruskin, FL. There she is conducting larviculture research on two pelagic spawning species of marine ornamentals by manipulating environmental and nutritional parameters during early life stages. After receiving her M.S she hopes to help manage an aquaculture facility or work at a public aquarium.

Throughout the world fish breeding facilities are increasing their aquaculture production. The values of the marine ornamental aquarium consumer are shifting to include more aquacultured fish due to the knowledge of declining ecosystems, the need for sustainable products and deleterious capture methods. Pelagic spawning speices produce underdeveloped larvae that rely on a diet of copepod nauplii and other small, easily digestible zooplankton or phytoplankton and may reqiure decreased light intesnity. Challenges associated with these characteristics need to be addressed for production of pelagic spawning species to become commercially viable. The melanurus wrasse (*Halichoeres melanurus)* and the pacific blue tang (*Paracanthurus hepatus)* are of great interest to aquaculture due to their popularity in the marine aquarium trade and lack of established rearing methods. Research investigating early larviculture protocols will help to elucidate ideal methods for culturing these species.

To investigate the environmental parameters that result in the highest survival and feeding incidence we conducted a variety of experiments. These experiments focused on 0-3 days post hatch (DPH) which encompasses the transition from endogenous nutrition to exogenous feeding, representing a critical bottleneck for survival. Embryos were sourced from populations of broodstock maintained in a greenhouse. The groups spawned at dusk, and the eggs were skimmed off the surface into an overflow collector (Fig. 1). The following day the eggs were enumerated with 150 wrasse or 300 pacific blue tang embryos stocked into each replicate. Temporal replicates were used due to limited number of embryos per spawn. Replicates were stocked into static 15L fiberglass tanks that were set up a day prior to embryo addition and followed the same timeline (Fig. 2).

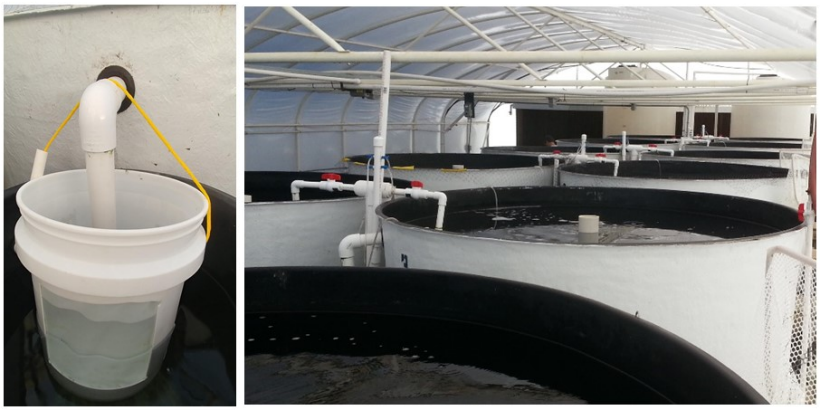


Figure 1. Broodstock tanks with a surface overflow egg collector.

All experiments utilized *Parvocalanus crassirostris* (parvo) nauplii, seived below 80um to accommodate for the larvaes small mouth gape. At the end of the feeding period on 3DPH, the larvae were counted for survival and a subset of 10 randomly chosen individuals were visually inspected for ingestion of parvo nauplii (Fig. 3) to determine feeding incidence.

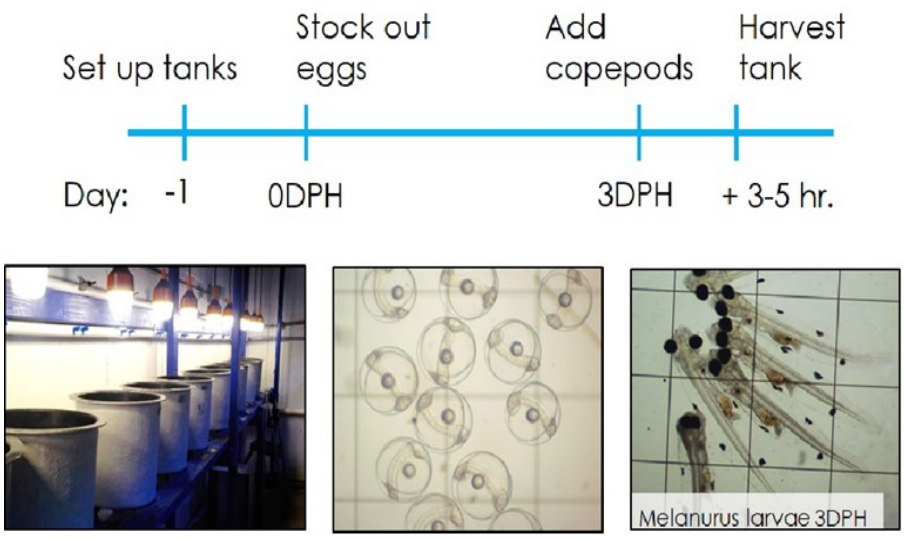


Figure 2. Timeline of 3DPH experiments.

To begin we investigated which microalgae species to include as greenwater. We used three commonly utilized microalgae species in the trade: *Tisochrysis lutea* (tiso)*, Tetraselmis chuii,* and *Chaetoceros muelleri* at a previously successful cell density (300,000 cells mL^{-1}). We learned from this experiment that tiso was the best species to use due to an increased survival and feeding result, so for all subsequent experiments we utilized this species. We then investigated what density of tiso would result in increased survival and feeding.

We tested treatments of 0, 100,000, 300,000 and 500,000 cells mL^{-1} and exposed the larvae to parvo nauplii for 3 hours at a density of 5 nauplii mL^{-1}. The highest survival and feeding results showed a survival percentage of ~65% for the melanuruss wrasse and ~70% eating within the 300,000 cells mL^{-1} treatment. For pacific blue tang the highest survival was ~20% (Fig. 4, 5) within the same treatment with no sign of prey ingestion, so subsequent experiments utilized a 5-hour prey exposure period. We then wanted to know if prey density had an affect on feeding with treatments of 2.5, 5 and 10 parvo nauplii mL^{-1}. For both fish species, we did not see any significant differences in prey ingestion between the treatments (Fig. 6). This tells us that we can use the lower density and still achieve identical feeding incidence. This is most likely due to the search time, capture success, and other factors affecting optimal foraging.

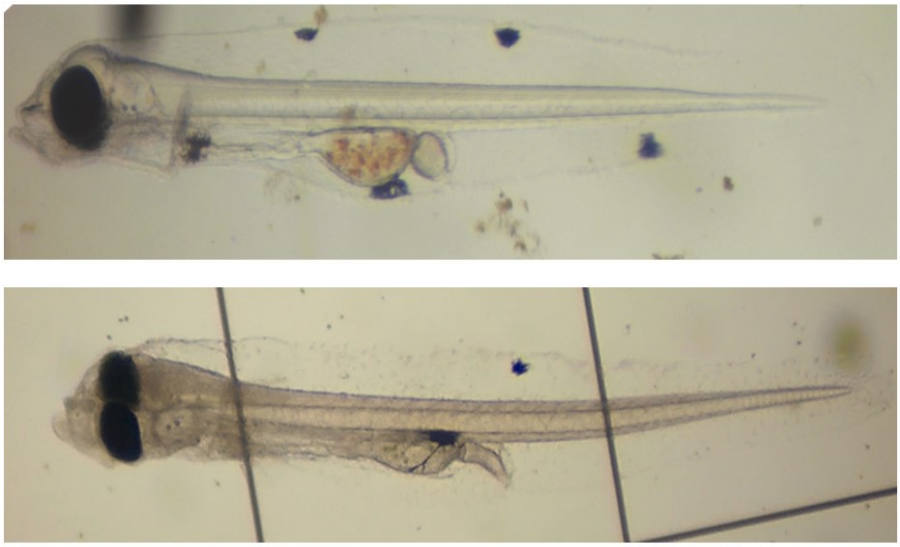


Figure 3. The top photo shows a larva that has ingested nauplii versus the bottom photo without any prey in its gut.

More investigations are underway. Effects of prey type, feed stimulants, photoperiod, and light intesnity are parameters that we are investigating to further increase survival and feeding incidence for these two fish species. These experiments are critical in order to determine ideal environmental conditions while still conserving costly live algae and prey resources. My research elucidates some culture methods with green water and copepod feeding that resulted in greater survival at 3DPH. If we can overcome this bottleneck and come out with more larvae after this stage, the chances of larvae reaching a marketable size increase. Ultimately, we want these methods to be utilized in the commercialization of these species and by conducting this research we can arm the producers with the knowledge of methods to increase survival and feeding.

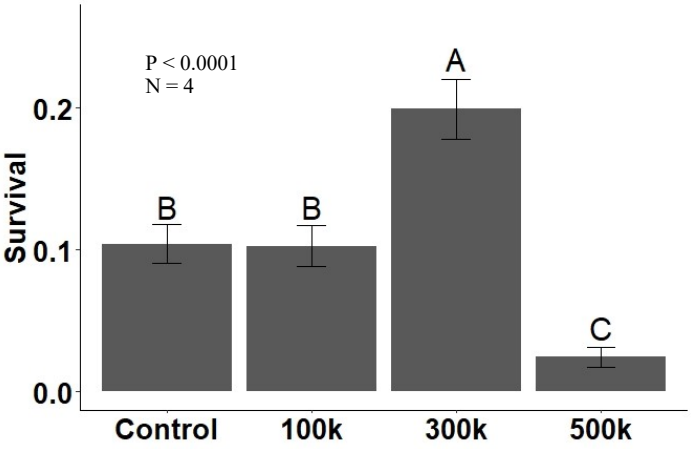


Figure 5. Survival results for pacific blue tang tiso density experiment.

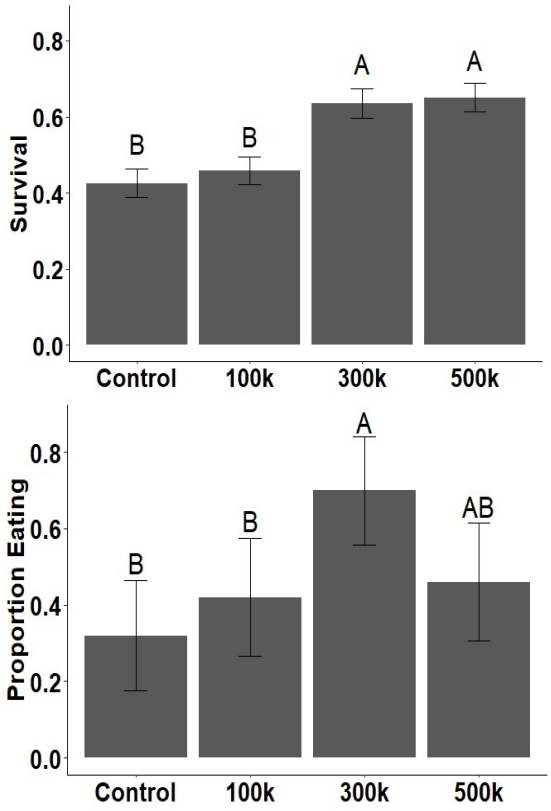


Figure 4. Survival and feeding incidence for melanurus wrasse as a result of tiso density.

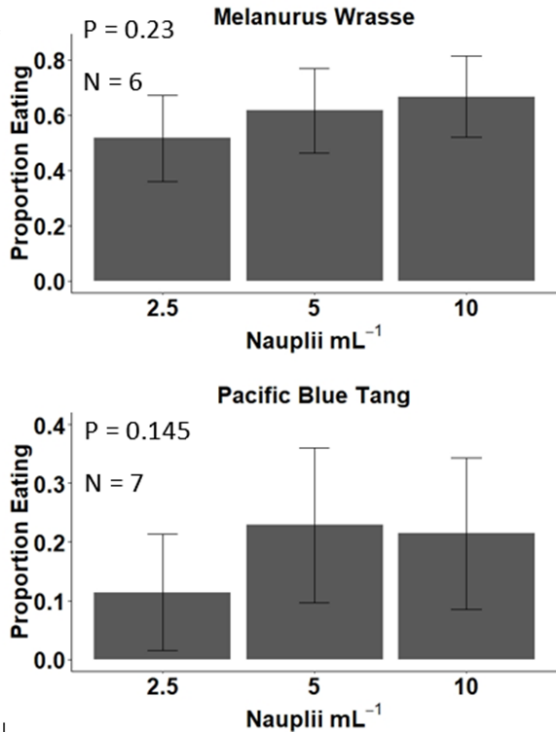


Figure 6. Results of prey density experiments.