GULF STATES MARINE FISHERIES COMMISSION

72nd ANNUAL SPRING MEETING

BRIEFING BOOK


Photo by Ali Wilhelm, GSMFC

MARCH 14 – 17, 2022

SHERATON PANAMA CITY BEACH GOLF & SPA RESORT

PANAMA CITY BEACH, FLORIDA

Gulf States Marine Fisheries Commission
Commission Business Session

Draft Agenda

Thursday, March 17, 2022
9:15 a.m. – 12:00 noon

1. Call to Order, Introductions, Opening Comments – Doug Boyd, Chairman
   - Brief Overview of Commission Voting Procedures – Dave Donaldson

2. Adoption of Agenda – Doug Boyd

3. Approval of Minutes (October 21, 2021) – Doug Boyd A

4. GSMFC Standing Committee Reports
   a. Technical Coordinating Committee – Darin Topping
      1. Artificial Reef Subcommittee
      2. Crab Subcommittee
      3. GulfFIN Committee
      4. Molluscan Shellfish Subcommittee
      5. SEAMAP Subcommittee
      6. Briefing on Invasive Species General Session
   b. State-Federal Fisheries Management Committee – Scott Bannon
      1. Menhaden Advisory Committee – Trevor Moncrieff
      2. Other Issues

5. Sea Grant Fisheries Extension Meeting Report – Laura Picariello

6. NOAA Fisheries Southeast Regional Office Comments – Jack McGovern

7. USFWS Region 4 Office Comments – Allan Brown/Glenn Constant

8. NOAA Fisheries and US Fish & Wildlife Budget Updates – Brian Pawlak/Allan Brown

9. GSMFC Program Reports
   a. Interjurisdictional Fisheries Program – Steve VanderKooy B
   b. Aquaculture Program – Steve VanderKooy C
   c. SEAMAP – Jeff Rester D
   d. CARES Act – Jeff Rester E
   e. Sportfish Restoration – James Ballard F
   f. Aquatic Nuisance Species Programs – James Ballard G
   g. Fisheries Information Network – Gregg Bray H
   h. Fisheries Restoration – Charlie Robertson I

10. State Directors' Reports
    a. Florida – Dan Ellinor
    b. Alabama – Scott Bannon J
    c. Mississippi – Joe Spraggins K
    d. Louisiana – Jason Froeba L
    e. Texas – Chris Mace M

11. Future Meetings – Nancy Marcellus
    a. October 18-20, 2022 – Texas
    b. March 14-16, 2023 – Louisiana

12. Review of Committee Listings – All N

13. Publications List and Web Statistics
    a. Publications – Dave Donaldson O
    b. GSMFC web site – Dave Donaldson P

14. Other Business

ADJOURN

Commission Business Meeting
October 21, 2021
Virtual

Call to Order

Chairman Doug Boyd called the meeting to order at 1:02 p.m. The following Commissioners and/or Proxies were present:

Doug Boyd, ***Chairman,*** *Citizen Representative from Texas*, Boerne, TX
Scott Bannon, ADCNR/MRD, Gulf Shores, AL *(Proxy for Chris Blankenship)*
Chris Nelson, *Citizen Representative from Alabama*, Bon Secour Fisheries, Bon Secour, AL
Jason Froeba, LDWF, Baton Rouge, LA *(Proxy for Jack Montoucet)*
John Roussel, *Citizen Representative from Louisiana*, Zachary, LA
Dan Ellinor, FWC, Tallahassee, FL *(Proxy for Eric Sutton)*
Joe Spraggins, MSDMR, Biloxi, MS
Rick Burris, MSDMR, Biloxi, MS *(Proxy for Joe Spraggins)*
Senator Jay Luneau, Alexandria, LA
Read Hendon, *Citizen Representative from Mississippi,* USM/GCRL, Ocean Springs, MS

Staff

Dave Donaldson, *Executive Director*, Ocean Springs, MS
Nancy Marcellus, *Administrative Officer*, Ocean Springs, MS
Chery Noble, *Administrative Assistant*, Ocean Springs, MS
Steve VanderKooy, *IJF Program Coordinator*, Ocean Springs, MS
Jeff Rester, *SEAMAP/Habitat Coordinator*, Ocean Springs, MS
Gregg Bray, *FIN Program Manager*, Ocean Springs, MS
Joe Ferrer, *Systems Administrator*, Ocean Springs, MS
James Ballard, *Sport Fish Restoration/Aquatic Invasives Coordinator*, Ocean Springs, MS
Donna Bellais, *ComFIN Programmer,* Ocean Springs, MS
Doug Snyder, *RecFIN(SE) Programmer/Survey Coordinator*
Angie Rabideau, *Senior Accountant*, Ocean Springs, MS
Deanna Valentine, *Scanning Specialist*, Ocean Springs, MS
Debbie McIntyre, *Staff Assistant*, Ocean Springs, MS
Ali Wilhelm, *Staff Assistant*, Ocean Springs, MS
Ashley Lott, *Grants Management/FIN/SEAMAP Staff Assistant*, Ocean Springs, MS
Charlie Robertson, *Fisheries Restoration Coordinator*, Ocean Springs, MS

Others

Lexa Skrivanek, National Academy of Sciences
LaDon Swann, MASGC, Ocean Springs, MS
Gordon Colvin, ECS Federal, Inc., Homosassa, FL
Christopher Mace, TPWD, Corpus Christi, TX
Kai Lorenzen, University of Florida, Gainesville, FL
Ashford Rosenberg, Gulf of Mexico Reef Fish Shareholders' Alliance, New Orleans, LA
Kayla Kimmel, USFWS, Baton Rouge, LA

Leland Moss, Water Institute of the Gulf, Baton Rouge, LA
Laura Picariello, TXSG, Corpus Christi, TX
Steve Sempier, MASGC, Mississippi State, MS
Grace Callahan, NAS, Portland, OR
Scott Ward, Fifth Estate, Tacoma Park, MD
Andy Strelcheck, NOAA Fisheries, St. Petersburg, FL
Jeremy Timbs, MSDMR, Biloxi, MS
Jason Saucier, MSDMR, Biloxi, MS
Michelle Duval, Mellivora Consulting, West Chester, PA
Allan Brown, USFWS, Atlanta, GA
Trevor Moncrief, MSDMR, Biloxi, MS
Chris Wright, NOAA, Silver Spring, MD
Luiz Barbieri, FWC, St. Petersburg, MS
Les Casterline, TPWD, Austin, TX
Amy Schuller, NOAA, Beaufort, NC
Tracy Floyd, MSDMR, Biloxi, MS
Darin Topping, TPWD, Rockport, TX

Opening Comments and Brief Overview of Commission Voting Procedures

D. Donaldson gave a brief overview of the Commission's voting procedures and stated there was a quorum. He recognized Ashley Lott for 10 years of employment with the Commission. He also welcomed the new Commissioner from Louisiana, Senator Jay Luneau, and newly appointed Regional Administrator for NOAA/NMFS Southeast Region, Andy Strelcheck.

Adoption of Agenda

R. Hendon moved to adopt the agenda as submitted. D. Ellinor seconded and the motion passed unanimously.

Approval of Minutes (March 17, 2021)

D. Ellinor moved to approve the March 17, 2021 minutes as submitted. R. Hendon seconded and the motion passed unanimously.

GSMFC Standing Committee Reports

Law Enforcement Committee (LEC)

L. Casterline reported the LEC met virtually with the Council's Law Enforcement Technical Committee (LETC) on October 12, 2021. Several Council items were addressed then the group discussed the continuation of the Strategic Plan and the Operations Plan. Each member will review these documents and determine if they are still useful in their current formats, should they be updated using current technology, or if they should be discontinued. This will be addressed at the March 2022 meeting. The Red Drum Task Force met virtually in August and they have an in-person meeting planned for December in Gulf Shores, AL. The Mangrove Snapper TTF has been delayed due to COVID but work should begin early next year. Jason Downey will serve as the law enforcement rep on that Profile. All state reports were submitted and are available on the Commission's website for review. The only action in the joint meeting was the election of Scott Pearce as Chair and Les Casterline as Vice Chair.

S. Bannon moved to accept the LEC Report. J. Froeba seconded the motion and it passed unanimously.

Technical Coordinating Committee (TCC)

D. Topping reported the TCC met with a full agenda on October 20, 2021. He said Mike Celata from the Bureau of Ocean Energy Management (BOEM) provided a brief overview of offshore renewable wind energy in the Gulf of Mexico. Representatives from each of the Gulf states presented information on ongoing IJF State Research Funding (SuRF) projects, also referred to as IJF small grants, and S. VanderKooy updated the Committee on IJF SuRF funds for FY22. J. Rester provided an update on the CARES Act. **D. Topping** stated each Coordinator gave brief reports on the active TCC Subcommittees. He said Matt Hill raised questions concerning the structure and content of the state's contract with GSMFC with respect to GulfFIN and costs MSDMR has incurred. These questions and concerns will be brought to the appropriate group for further discussion. Darrin Topping was elected Chair and Beverly Sauls Vice Chair for TCC.

S. Bannon moved to accept the TCC report. R. Hendon seconded the motion and it passed unanimously.

State/Federal Fisheries Management Committee (S/FFMC)

S. Bannon reported the S/SFMC met October 20, 2021 and the committee has four motions to be approved by the Commission.

GulfFIN Priorities

S. Bannon stated Gregg Bray outlined the status of 2022 GulfFIN funding for data collection and management activities. The proposed amount available for FIN funding in 2022 totals $6.79M. The total proposed spending for 2022 for all the high priority GulfFIN jobs is $6.63M, which would result in a potential surplus of $165K. After discussion, the committee made the following motion:

The State/Federal Fisheries Management Committee moved to accept the proposed funding for GulfFIN activities for 2022 (Coordination and Administration of FIN Activities; Collecting, Managing, and Disseminating Marine Recreational Fisheries Data; Operation of FIN Data Management System; and Trip Ticket Program Operations) for a total budget of $6.63M and to forward this onto the full Commission for their approval. The motion passed unanimously.

The Commission approved the motion unanimously.

SEAMAP Priorities

S. Bannon stated Jeff Rester provided background on the SEAMAP budget and surveys for the Gulf of Mexico. All three SEAMAP components based their FY2022 budget on level funding of $5.125 million. The total funding amount proposed for the Gulf was $2.02M. The S/FFMC reviewed the various SEAMAP surveys along with their associated costs. After discussion the committee made the following motion:

The State/Federal Fisheries Management Committee moved to accept the proposed funding for SEAMAP surveys for 2022 for a total budget of $2.02M and to forward this onto the full Commission for their approval. The motion passed unanimously.

The Commission approved the motion unanimously.

IJF Priorities

S. Bannon said S. VanderKooy discussed the Interjurisdictional Fisheries State Research funding program. With increases in IJF funding the program is supporting a program to assist with important research priorities at the state level. A total of $1.4M has been made available in 2021 and $974,800 is being made available in 2022. S. VanderKooy reviewed 14 projects being completed by state partners in 2022. After discussion, the committee made the following motion:

The State/Federal Fisheries Management Committee moved to accept the proposed funding for IJF State Research Funding for 2022 for a total budget of $974,800. The motion passed unanimously.

The Committee approved the motion unanimously.

Menhaden Advisory Committee (MAC)

S. Bannon reported T. Moncrief provided the Menhaden Advisory Committee report. The MAC met virtually on Tuesday, October 5, 2021. He said Dr. Amy Schueller (NOAA Beaufort) presented the results of the Operational Assessment for Gulf Menhaden (GDAR03). After some discussion, the committee made the following motion:

The State/Federal Fisheries Management Committee moved to accept the Operational Assessment Report for Gulf Menhaden (GDAR03) and send it onto the Commission Business session for their approval. The committee approved the motion unanimously.

The Commission approved the motion unanimously.

S. Bannon reported Ray Mroch presented the menhaden 2021 landings through the end of August. According to the report, there was a 6.1% decrease from last year and an 18% decrease from the 5-year average. Two presentations were made by the Ecosystem modeling community. The models included environmental stressors driven by the Mississippi River watershed and the hypoxic zone which vary spatially and temporally resulting in variable menhaden mortality which were included as sensitivity runs in the assessment. Peter Himchak (Omega Protein) stated that the auditors have started the surveillance for Gulf Menhaden MSC Certification. Francois Kuttel (Daybrook) explained that NOAA has ordered observers to assess a proof of concept program by putting cameras on one of the fleet's steamers to record interactions with marine mammals and turtles in the wild. They will be deploying floating models of turtles and testing if they end up in the nets. Two observers and two drone pilots will spend next week testing the protocols.

The federal partner is next on the rotation for MAC Chair but Ray Mroch will be moving to a new position at NOAA and he recommended that Trevor Moncrief (MS) continues as chair for the coming year. The MAC agreed unanimously.

S. Bannon stated the Gulf of Mexico Fishery Management Council has made a recommendation to NOAA Fisheries to implement calibrations for state survey red snapper estimates starting in 2023. During the Council meeting there was a motion asking for additional coordination between NOAA Fisheries, state partners, and GSMFC to understand differences between state surveys and the federal general survey. There will be a meeting in January 2022 to discuss this issue in detail.

Scott Bannon was elected Chair and Luiz Barbieri was elected Vice Chair for the State/Federal Fisheries Management Committee.

R. Hendon moved to accept the State/Federal Fisheries Management Committee Report. D. Ellinor seconded the motion and it passed unanimously.

Sea Grant Fisheries Extension Meeting Report

L. Picariello reported the Sea Grant Fisheries Extension met Virtually October 7, 2021. She stated each state was represented and each member gave their state report (included in Sea Grant Minutes). She also reported on the Sea Grant Regional Projects that include two depredation projects, the Sea Grant Reef Fish Extension Team starting a 4-year project designed to have regional cohesive communications, outreach, education and messaging regarding the reef fish fishery, two NRDA Open Ocean projects with the shrimp fishery, the Careers of the Sea Grant Projects which assess training needs for fisheries/aquaculture and seafood industries, and the Gulf Commercial Fishermen Training Program in collaboration with industry members across the Gulf. Details of all Sea Grant Projects are in the Sea Grant section of this minute book.

NOAA Fisheries Southeast Regional Office Comments

A. Strelcheck stated the full report is in Tab B of the Briefing Book. He reviewed several of the actions taken by the Gulf of Mexico Fishery Management Council. He stated the Council approved to increase the catch limit for Lane snapper and they are hoping to reopen the fishery next month. As of August 1, NOAA requires TEDs for skimmer trawls on vessels 40 feet or longer. Louisiana has been exempted due to Hurricane Ida impacts. He said a new permits online system has been implemented and they are hoping this will be a more efficient and effective process for fishermen to receive their fishing permits. NOAA is moving forward with aquaculture in the Gulf of Mexico and more details on the projects are in the Briefing Book. NOAA is also working with BOEM on wind energy leasing sites as wind energy projects are developing rapidly in the Gulf. **A. Strelcheck** said a decision should be made soon on who will replace him as the Deputy Regional Administrator for Fisheries.

USFWS Region 4 Office Comments

A. Brown reported not much has changed since his last report as they are operating on a Continuing Resolution until December 3. He said they are expecting some significant increases in specific areas in the FY22 budget mainly for Invasive Carp. He thanked J. Ballard and the Commission office for their continued administration of the small grants program. He said that USFWS personnel are restricted from attending any meetings with more than 50 people attending but they continue doing the necessary field work for their conservation efforts. Kayla Kimmel reported the Baton Rouge office is continuing their habitat suitability index in coastal estuaries in Louisiana for protected resources like gulf sturgeon, the acoustic telemetry project on the

American Eel and the continued coordination and support for invasive carp in the south and on the Gulf coast.

NOAA Fisheries Budget Update

A. Strelcheck stated that NOAA continues to operate under the Continuing Resolution so there is not much to report on the Budget. He said there is a number of bills circulating through Congress that will influence the budget and potentially NOAA Fisheries relating to climate change, environmental justice and survey activities.

D. Donaldson stated the House Bill recommends over a $1B budget for NOAA which is $80M above the FY21 budget. He said there will be increases of $16.5M for fisheries data collection and assessment, $2.25M for the for-hire electronic monitoring and reporting, and level funding for aquaculture, the regional Councils and Commissions and IJF line items. He said he is cautiously optimistic for the programs the Commission coordinates with the states. The Senate has not yet passed a bill.

Presentation on Economic Development Administration (EDA) Good Jobs Program

D. Donaldson stated LaDon Swann, Director of the Mississippi/Alabama Sea Grant Consortium (MASGC), will give the presentation on this topic. He said he had received a call from Commissioner Chris Nelson asking if he was aware of this project and stated it was mentioned the Commission could take a role in this program.

LaDon Swann gave the presentation on ***EDA Good Jobs Program***. He said the goal of this program is to connect employers in industry with key regional stakeholders. The desire outcome is to get Americans back to work and increase wage growth, as well as develop demand-driven systems that will continue to support Americans in securing and retaining quality jobs. EDA will award $500M for good jobs and plans on funding 25-50 awards at $10-20M per project. This can be done through grant or cooperative agreement and the submission deadline for proposals is January 22, 2022. Projects will be awarded through September 30, 2022 and must be completed by September 30, 2027. He then reviewed the different phases of the program and stated it would need a System Lead Entity. The presentation is available per request to the Commission office and even more information is available at www.eda.gov/https://www.eda.gov/funding-opportunities/.

L. Swann asked if the Commission would be interested in serving as the System Lead Entity for the program. The Commission discussed the possibility of submitting a proposal for the program. This would be a large program and the submission deadline for a proposal is January 22, 2022. There was concern on developing a proposal in such a short time and L. Swann and A. Rosenberg volunteered staff support to help the Commission develop the proposal if the Commission decided to submit a proposal to take the lead.

After extensive discussion, R. Hendon moved for D. Donaldson to discuss/research this further with L. Swann and others, and to decide if it would be possible to submit a proposal before the deadline and have the available resources (staff, office space, office equipment, etc.) to be the lead entity if the proposal is accepted. If D. Donaldson thinks the Commission could be the lead entity, he should make the decision. J. Roussel seconded the motion.

More discussion ensued and D. Boyd stated this is an extremely large project and it would start in a couple months and he feels it needs to be discussed further. He offered a substitute motion for D. Donaldson to research further and bring the information to the Executive Committee for the final decision. R. Hendon seconded the substitute motion and it passed unanimously.

Presentation on National Academic of Sciences' Data and Management Strategies for Recreational Fisheries with Annual Catch Limits

Luiz Barbieri gave a brief presentation of the results of the National Academies of Sciences ***Data Management Strategies for Recreational Fisheries with Annual Catch Limits*.** He recognized Michelle Duval and Kai Lorenzen who were also on the study committee and who are here to address any questions the Commission may have on the presentation or results of the study. He stated the study has two main dimensions. One that deals with recreational fisheries data looking at data or survey improvements to address in-season management and the other being looking at alternative management or strategies that could be used in situations where improvements to the data may not be sufficient to meet the needs of in-season management. He reviewed the Committee Charge which was if and how the design of the MRIP, for the purposes of stock assessment and the determination of stock management reference points, can be improved to better meet the needs of in-season management of ACLs; what actions the Secretary, Councils, and States could take to improve the accuracy and timeliness of data collection and analysis to improve or supplement the MRIP and facilitate in-season management; and alternative management approaches that could be applied to recreational fisheries, consistent with requirements for fisheries with ACLs, for which the MRIP is not sufficient to meet the needs of in-season management. **L. Barbieri** reviewed the results of the study and the presentation is available upon request to the Commission office. The complete report of the study is available for download at www.nap.edu.

Selection of Lyles/Simpson Award Recipient Selection for 2022

D. Donaldson stated an in-person meeting is planned for March 2022 and the Commission will present Harriet Perry the ***2020 Lyles/Simpson Award***. Then the 2022 award will be presented at the October meeting. He sated there is a list of past recipients in the briefing book and **D. Boyd** opened the floor for nominations for the 2022 recipient.

S. Bannon moved to nominate Dr. Tom McIlwain the recipient of the 2022 Lyles/Simpson Award. R. Hendon seconded the motion and it passed unanimously.

GSMFC Program Reports

D. Donaldson stated that due to time constraints, the Program Coordinators will give a brief presentation on their Program. Detailed reports are in the Briefing Book from Tab N through Tab U. He asked that if anyone has questions, to contact the Coordinator after the meeting.

Interjurisdictional Fisheries Program

S. VanderKooy reported the Tripletail Genetics project should be completed this fall and the report will be available in the Spring of 2022. He said the acoustic tagging of Tripletail was started in 2019 and weather permitting they plan to tag more tripletails this year before they completely move out of the northern Gulf. They are still planning a regional flounder symposium in 2022 and are working with staff from LSU and the LA Sea Grant to plan the symposium. He said the ***Annual***

Report of the Gulf States Marine Fisheries Commission for 2020 is at the printer and copies should be available within the next few weeks.

Aquaculture Program

S. VanderKooy reported 19 proposals were received for 2022. The final decisions are being made to award the projects and $1.4M is available in funding. Additional funds were provided to the Commission through NOAA for development of an Integrated Multi-Trophic Aquaculture (IMTA) demonstration project to culture native species of finfish, bivalve mollusks, and macroalgae in the region's state waters. The RFP was released in July with $1.8M available and reviews have been completed and they are in the process of awarding the projects. He said projects from 2019-2020 are ongoing due to COVID, weather, etc., but they should be completed soon.

SEAMAP

J. Rester reported SEAMAP has completed the Spring Plankton, Summer Shrimp/Groundfish, Bottom Longline, Reef Fish and Fall Plankton Surveys. The Vertical Line Survey and Fall Shrimp/Groundfish Survey are currently ongoing. He said the ***SEAMAP Annual Report to the Technical Coordinating Committee*** has been published. The SEAMAP Subcommittee met this summer to discuss various issues. One topic discussed is the continuation of the Vertical Line Survey. If the data from the survey are not used in the upcoming Red Snapper stock assessment, they may decide to discontinue this survey. The Commission continues to manage SEAMAP data and distribute the data to interested parties. The Commission has fulfilled four SEAMAP data requests since March.

CARES Act

J. Rester stated the detailed CARES Act report is in Tab Q of the Briefing Book. He said the CARES Act dedicated $300M in fishery assistant funding for affected fisheries participants who incurred a greater than 35% loss as compared to their previous 5-year average. The Gulf States allocations were: Texas $9,237,949; Louisiana $14,785,244; Mississippi $1,534,388; Alabama $3,299,821; for a total of $28,857,402. He reported how funds were distributed among the states. He stated in December 2020 the Consolidated Appropriations Act, 2021 was signed into law and it provided an additional $300M for fisheries disaster assistance. The funding criteria was basically the same as the original act and the funding total for the Gulf states was $26,273,006. The new program required each state to develop a new spend plan. He then reviewed the distribution of funding to each state.

Sportfish Restoration (SFRP)

J. Ballard stated they continue to work with the Atlantic States Marine Fisheries Commission to plan the next joint artificial reef meeting for the spring of 2022. He said as reported last time, the water quality monitoring project is moving forward. They have acquired all the gear necessary which has been deployed to collect the water quality parameters at several artificial reef sites. When the units are collected from the sites the data will be available on the website. He said acoustic receivers were also installed in the gear to collect more fish tag data at each location for the IJF Program. He said the SFRP continues to work with MSDMR to support the Jimmy Sanders Memorial Lionfish Challenge which was switched to a virtual tournament. This is working well and they are receiving plenty of support from private sponsors of the tournament.

Aquatic Nuisance Species Programs (ANS)

J. Ballard reported they are continuing their partnership with USFWS Region 4 to administer their small grants program. He said since they have started administering the small grants they have funded a total of 43 projects totaling over $1M covering a whole suite of species and different management issues dealing with invasive species in the region. When the individual projects are completed, the PIs present their finding to the regional panel of Aquatic Invasive Species. He stated 23 proposal were received in 2021 and 4 projects were selected for funding totaling $177,693. He reviewed each proposal that is listed in the Briefing Book. The ANS program continues to provide the traveling trunks for education and outreach and they have been utilized 1,590 days since the program started. **J. Ballard** said he is chairing the ANSTF's Prevention Committee which is tasked with addressing five key outputs of the new ANSTF Strategic Plan. The GSARP is scheduled to hold its fall meeting virtually on December 1-2 and the fall ANSTF meeting will be held virtually on November 4-6.

Fisheries Information Network (FIN)

G. Bray reported all of the data collection programs are functioning well, providing data for science and management. He said they have successfully transitioned away from paper reporting methods to electronic tablets for collecting the MRIP data. It has been a huge success and they receive data 4-5 days sooner than with the paper reporting method. They are assisting NOAA Fisheries with the Southeast for-hire electronic reporting program which is a new data collection system for federally permitted for-hire operators. He said they are helping specifically with the dockside validation survey that the states are going to be administering and they are in the process of training the samplers. He said they are continuing research on commercial conversion factors and they completed the first phase of the project in 2020. He said this effort will continue and he will keep the appropriate committees and the Commission updated on the project.

Fisheries Restoration

C. Robertson stated a detailed description of the program is in the Briefing Book. He said a large portion of the project is the ***Return 'Em Right*** outreach and education campaign. He is working with Sea Grant and other partners to promote the best release practices with an emphasis on the proper use of descending devices to improve survival of discarded reef fishes. He reviewed the four projects the Commission is funding focusing on reducing post-release mortality from barotrauma in Gulf of Mexico reef fish recreational fisheries. He said they are also working to convene a work shop at the end of the year to discuss developing a manual on best release practices.

Executive Committee Report

D. Boyd stated the Executive Committee report was submitted to the Commissioners before the meeting. He said the meeting was called to order this morning at 9:05am and the members on the virtual meeting were D. Boyd, S. Bannon, J. Froeba, J. Spraggins and D. Ellinor. Staff members were D. Donaldson, N. Marcellus and A. Rabideau. The agenda was approved and they reviewed the Audit. A new firm was used and D. Donaldson reported everything went well and they were given an unqualified opinion. **D. Donaldson** gave a quick overview of the OIG Audit stating the Commission and Louisiana had to pay money back to NOAA. They thought this was settled when the Commission received a bill for $7M. He said the debt has been waived but they have not received official notification to give to the Commission auditors. **D. Boyd** said they reviewed the financial report and the budget for next year is $12.699M. A motion was made by S. Bannon to

approve the budget. The motion was seconded and it passed unanimously. There was discussion on the ***Lyles/Simpson Award*** and staff compensation. The Executive Committee decided to establish a minimum yearly raise. S. Bannon moved to establish a minimum raise of 2.5% or $1,000, whichever is larger, for all staff that meet or exceed expectations related to their job performance. All raises would be contingent upon availability of funds in the GSMFC budget for the coming year. The motion was seconded and passed unanimously. **D. Boyd** stated D. Donaldson noted that Texas and Mississippi have additional representatives that need to be appointed to the Commission.

S. Bannon moved to accept the Executive Committee Report as written. R. Hendon seconded the motion and it passed unanimously.

State Directors' Reports

All state Directors' Reports were submitted and are in the Briefing Book and will be Attachment I of these minutes. **D. Boyd** asked if anyone had additional items to add to their report or if there was something specific they would like to discuss. The Commission decided to forgo reports due to limited time. If anyone has any questions they should contact D. Donaldson or the representative from the specific state.

Future Meetings

N. Marcellus reported the March meeting will be the week of March 16-18, 2022 in Florida. She said she will send bids to hotels in the Panhandle that the Commission has used in the past and she will contact D. Ellinor for the final decision on where to convene the meeting. The October meeting will be October 19-21, 2022 in Texas and she will contact D. Boyd for suggestions on where to convene the meeting.

Publications List and Web Statistics

D. Donaldson stated that Tab CC and DD of the Briefing Book has the information for GSMFC publications and web statistics. He asked if there are any questions to contact the Commission office.

Discussion of Election of Officers

D. Donaldson recommended keeping the current officers in place because the Commission has not had an in-person meeting since they were elected.

J. Spraggins moved to keep the current roster of officers until October 2022. R. Hendon seconded the motion and it passed unanimously.

The officers are:

Doug Boyd, Chairman
Scott Bannon, 1st Vice Chairman
Jason Froeba, 2nd Vice Chairman

Other Business

D. Donaldson informed the Commission that Senate Bill 2923 has been introduced by Senator Wicker from Mississippi. The Bill will improve the fisheries resources disaster relief program for NOAA Fisheries by providing more timely deadlines in determining fisheries disasters and allocating the funds in a timelier manner.

There being no further business, the meeting adjourned at 5:02 p.m.

ATTACHMENT 1

Gulf States Marine Fisheries Commission
Technical Coordinating Committee (TCC), Fall 2020 Meeting
Florida Report

1. Emerging Issues Pertinent to Gulf of Mexico Fisheries.

Hurricane Disaster Relief

FWC received $44.5 million grant from NOAA Fisheries in June 2019 to help fisheries-related businesses impacted by Hurricane Irma. Staff is working with Chairman Spottswood on details of the payout programs. So far, more than $24.9 million in direct payouts have been made to commercial fishers, wholesale dealers, and charter fishermen. Over the next year, $3.4 million will be spent reimbursing wholesale dealers for facility upgrades or repair, and $2.5 million is expected to be spent on marine debris in the Keys. Over the next 3-4 years, $2.8 million will be spent on mitigating loss of coral due to the stony coral tissue loss disease, nearly $5 million dollars will be spent on four habitat improvement projects, and $5.5 million will be spent on fishing infrastructure projects.

In March of this year, FWC received notification of $7,812,000 in funding to help those fisheries-related businesses impacted by Hurricane Michael. FWC staff, working closely with Chairman Spottswood, coordinated with affected stakeholders to develop a spend plan to mitigate the fisheries-related damages caused by Hurricane Michael. After reviewing submitted public comments, the proposed spend plan was submitted to NOAA in early September, which outlines methods and budgets to provide relief to commercial aquaculturists, fishermen, and wholesale dealers, as well as marinas and licensed charter businesses.

CARES Act

On March 27, 2020, President Trump signed the CARES Act into law. When the CARES Act became Public Law 116-136, it was the third legislative relief package that Congress passed as a result of COVID-19. Public Law 116-136 created $2 trillion of relief for Americans affected by COVID-19. One of its major provisions related to the fishing industry was $300 million for fishery disaster assistance nationwide. Of that, Florida will be allocated $23,636,600. All relief money for Florida fishing-related businesses will be distributed by the Atlantic State Marine Fisheries Commission, working in cooperation with the FWC. FWC staff, working closely with Chairman Spottswood, developed a spend plan to mitigate the COVID-19 financial impact to the Florida fishery. After reviewing public comments, the proposed spend plan was submitted to NOAA in early August, outlining methods and budgets to provide relief to commercial aquaculturists, fishermen, and wholesale dealers, as well as licensed charter businesses. FWC has received comments from NOAA for further information and/or clarification regarding the spend plan. FWC staff are addressing these comments and submitted the final proposal in

mid-September. FWC staff are also gathering the necessary fishery-related data from each sector to prepare applications.

Oysters

Apalachicola Bay Oysters. Apalachicola Bay historically supported expansive oyster reefs and a culturally important oyster fishery. Harvest dropped dramatically in 2013 and oyster abundance continues to remain at historic lows. In early 2020, FWC was granted funds for large-scale oyster restoration and to develop an adaptive oyster management plan. At the July 2020 Commission meeting, the Commission supported restoration efforts in the Bay by approving draft rules to suspend harvest of wild oysters and prohibit on-the-water possession of tongs, and by proactively implementing these measures by Executive Order. Staff will present proposed final rules that establish these conservation measures in rule through December 2025. Staff will continue monitoring oyster recovery and can reevaluate whether harvest opportunities are available prior to December 31, 2025.

Flounder

A stock status update completed by FWC's Fish and Wildlife Research Institute found that the flounder fishery on the Atlantic coast of Florida is likely overfished and undergoing overfishing and that there has been a general decline in the fishery statewide. Staff has been gathering public input on management of this fishery and, at the July 2020 Commission meeting, the Commission approved a series of proposed draft rules intended to improve the long-term sustainability of the fishery and directed staff to continue working with stakeholders on allowable bycatch of flounder in federal waters.

Federal Consistency

Atlantic Reef Fish Hook Requirements. The South Atlantic Fishery Management Council (SAFMC) recently modified hook requirements for Atlantic reef fish in federal waters as part of an effort to increase survivorship of released fish and promote best fishing practices. To be consistent, staff propose approval of a federal consistency action that would implement the same hook requirements for those harvesting reef fish on board a vessel in Atlantic state waters. This proposed rule would require the use of non-stainless-steel, non-offset circle hooks north of 28° N. latitude and require the use of non-stainless-steel hooks south of 28° N. latitude. Staff will also present current outreach and education efforts to encourage best fishing practices for reef fish, including the voluntary use of descending devices.

2. Activities Related to Artificial Reef Programs.

Florida Artificial Reef Construction

From January through September 2020, there were 57 new patch reefs created from a total of 68 artificial reef deployments state-wide that were comprised of 39 prefabricated concrete module deployments (343 modules totaling 1,153 tons), twelve secondary-use concrete material deployments (5,935 tons), two vessel/barge reefs (276 tons), and 15 limestone boulder deployments (5,469 tons). Of the 68 artificial reef deployments, 44 (65%) were funded by the Florida Fish and Wildlife Conservation Commission (FWC) and 24 (35%) were funded by local government, non-government organizations, and private sources.

The FWC funded artificial reef construction projects were completed utilizing funds from the State of Florida Marine Resource Conservation Trust Fund, the U.S. Fish and Wildlife Service's Federal Sport Fish Restoration Program, and the Natural Resource Damage Assessment (NRDA) Early Restoration Phase III, Florida Artificial Reef Creation and Restoration Project.

Florida Artificial Reef Monitoring and Research

From January through September 2020, a total of nine artificial reef monitoring projects managed by the FWC Artificial Reef Program were completed or ongoing. Five artificial reef monitoring projects took place off the Gulf Coast and four off the Atlantic Coast. These include the following projects:

Ongoing:

- Oriskany Reef Fish PCB Monitoring Project (Northwest Florida – Gulf)
- Taylor County Volunteer Artificial Reef Monitoring Project (Central Florida – Gulf)
- Artificial Reef Fish Community Dynamics Research, USF (Central Florida – Gulf)
- St. Marks Artificial Reef Monitoring Project, FSU (Northwest Florida – Gulf)
- St. Johns River Artificial Reef Monitoring Project, JU (Northeast Florida – Atlantic)
- Economic Impact and Valuation of Southeast Florida Artificial Reefs, NOAA (Southeast Florida – Atlantic)
- Aquarius Reef Base Predatory Behavior Monitoring Project, FIU (Southeast Florida – Atlantic)
- Depredation and discard mortality of Permit Monitoring Project, FIU (Southeast Florida- Atlantic)

Completed:

- Sarasota Bay Artificial Reef Monitoring Project (Southwest Florida – Gulf)

Florida Artificial Reef Outreach

From January through September 2020, FWC Artificial Reef Program and Florida Sea Grant have been coordinating planning for the Florida Artificial Reef Summit. Originally planned for April 8-10, 2020 in Melbourne, FL, the Summit is now planned for November 4-6, and has been changed to a virtual format due to COVID-19. Held every five years, approximately 200 attendees representing local governments and other stakeholders including some artificial reef managers from other states are expected to participate. The theme of the 2020 Summit is "Bringing the Future of Florida's Artificial Reefs into Focus". Over 54 abstracts for oral and poster presentations will be presented, including marine fisheries management, impacts of natural disturbances (e.g., hurricanes & harmful algal blooms), environmental mitigation, human dimensions, socioeconomics, tourism, and regulatory policy. Florida's success and forward-thinking development of artificial reefs can be attributed to the long-standing partnerships and exchange of ideas and lessons learned that have been fostered by the Florida Artificial Reef Summit. In addition to the main virtual Summit platform, the Summit will also be broadcast live and video of each presentation to be available for viewing later on the Florida Sea Grant webpage under 'Workshops and Summits': https://www.flseagrant.org/fisheries/artificialreefs/.

3. Activities Associated with the Gulf of Mexico Crab Fisheries.

Florida's blue crab landings through 2019 suggest a continuation of landings volume below its historic average, beginning in 2000. The 2019 landings are the highest since 2012 and appear to follow the historical cycle of 5-10-year intervals of landings "lows" and "highs" (Appendix A). The complete GSMFC Crab Subcommittee State Report for Florida is attached to this report as Appendix A.

4. Activities Related to Fisheries Dependent Data Collection.

On March 25, 2020, all field work related to fisheries dependent monitoring activities was suspended in response to the emerging Covid pandemic. The following is a summary of how data collection programs were impacted in the months that followed.

Recreational Fisheries

Assignments for the MRIP access point angler intercept survey, Gulf Reef Fish Survey, and FIN Biological Sampling were cancelled entirely during April and the first half of May in response to state lock-down orders. During April and May, recreational fishing in the Florida Keys was severely restricted due to a checkpoint on Highway 1 that only allowed entry to residents, and recreational boating was restricted in Dade and Broward

Counties in an effort to control large gatherings. However, throughout the rest of the state, very high fishing pressures were recorded at sites while angler interviews were suspended. Dockside surveys resumed in mid-May during phase 1 of Florida's re-opening once personal protective equipment could be procured. New safety protocols during phase 1 included a cap of 10 angler intercepts per assignment to limit potential exposure and transmission. However, many assignments continued to be cancelled at sites that were closed, where boating activity was restricted, and at sites with very high levels of recreational fishing and boating activity where it was unsafe for staff to conduct interviews with the public. Florida's phase 2 re-opening began in early June and the interview cap was increased to 50 anglers per assignment. Phase 2 re-openings were delayed until mid-September in Southeast Florida due to higher Covid transmission rates. All interview caps were lifted in September during phase 3 of Florida's re-opening.

Surveys that monitor fishing effort continued without interruption during the pandemic. Weekly sample sizes for the MRIP For-Hire Telephone Survey were increased to 20% of charter vessels in sample frame during Wave 3, and 15% during Wave 4. Increased sampling was requested by FWC to ensure that impacts due to covid-19 on charter fishing effort in Florida could be well documented. The mail survey for the Gulf Reef Fish Survey also continued without interruption.

In July, 2020, long-term funding to continue Florida's Gulf Reef Fish Survey (GRFS) and expand it statewide was included the State budged signed by Governor DeSantis. The survey was renamed the State Reef Fish Survey (SRFS), and the mail survey questionnaire was modified to allow fishing effort to be reported along Florida's Gulf and Atlantic coasts. FWC worked with NOAA Fisheries to incorporate supplemental intercept assignments in the monthly sample draw for the MRIP APAIS. In addition to the suite of reef fish species included in the GRFS, three new reef fish species will be monitored in the statewide survey: Hogfish, Yellowtail Snapper, and Mutton Snapper. The recreational season for Red Snapper was open along the Gulf Coast of Florida June 11 through July 25. Landings in June were monitored through the GRFS and 31% of the State's annual catch limit was landed during the first 20 days of the season. The June GRFS estimate was made possible by NOAA Fisheries, who shared MRIP APAIS intercept data with FWC while they continue to address data gaps due to Covid-19 and work on a solution to generate Wave 3 estimates. The state will generate the July landings estimate through the SRFS (using identical methods to GRFS) once MRIP APAIS data are available in mid-October. In the interim, FWC provided management advice in-season by employing a predictive model that uses sample weights from angler interview data collected through supplemental SRFS intercept assignments, which project total landings before final estimates are available.

Commercial Fisheries

Since early 2017, Florida FWC has been working with Bluefin Data, along with Texas, on the development of a new web-based wholesale dealer reporting application (VESL). In Florida, VESL is now used in conjunction with a point of sale swipe card system which uses mobile devices such as smart phones and tablets along with mobile/desktop card readers and/or a barcode scanner to validate license and vessel data from the fisher's license card and initiate the electronic trip ticket for the fisher-dealer landing transaction. A state-only version of VESL has been in production since April 2019 and Florida now has 90+ dealers registered for the web-based application. The full version of VESL with the federal fields is expected to be ready for production by October 31, 2020.

Florida is also currently participating in a Gulf-wide project collecting shrimp size and weight data from commercial fishing trips for evaluating current head-on/head-off shrimp conversion factors. The original completion date for sampling on this project is by October 31, 2020. As of September 24, 2020, commercial field staff have collected 1,371 samples of the primary Gulf shrimp species in Florida. The sampling target for pink shrimp, which constitutes 85-90% of Florida Gulf shrimp landings, has been met. Difficulties in getting samples of brown and white shrimp include fewer trips for sampling opportunities, along with the primary season being late-spring-summer which was highly affected by a temporary stoppage, and then reduced sampling during this time due to COVID-19. To date, no white shrimp have been encountered, and only 116 brown shrimp samples have been collected.

The 2019 commercial landings information are complete as of July 31, 2020, and subject to revision. Preliminary commercial landings for 2020 are complete through about June. As of September 21, 2020, the number of trip ticket records received in 2020 are down about 15% from March-September as compared to the same period in 2019, and down about 18% for the first three months (March-May) since the start of COVID-19 in Florida.

During 2020, Florida FWC commercial field staff continued to conduct bio-statistical sampling for the NOAA Fisheries Trip Interview Program (TIP), though at a reduced level due to COVID-19. Staff were instructed to cease activities as of April 3rd, then resumed limited sampling as of May 4th and only with appropriate PPE equipment in place. These safety protocols have continued to date. Through August of 2020, sampling of commercial catches along the Gulf coast of Florida accounted for 391 TIP interviews, almost 16,832 fish measured, and nearly 9,019 age structures. While the number of interviews performed so far in 2020 is down 22% as compared to 2019, the number of fish measured is only down 11%. These decreases are primarily due to COVID-19. During periods of non-sampling, staff have filled their time with data entry, site monitoring, and other related tasks. TIP sampling in Florida is funded from a variety of funding sources that include: State of Florida, NOAA Fisheries, Gulf FIN and NFWF.

Southeast Headboat Survey activities supported through Gulf FIN:

Through March 2020, a total of 90 intercepts were conducted statewide in Florida with 1,636 fish sampled. Florida FWC and NOAA Fisheries halted field sampling activities in the Southeast Headboat Survey as of April 4, 2020 due to COVID-19. To date, no

further dockside sampling has taken place because of the close proximity of field staff to numerous anglers and vessel crew in limited space. During this time, staff have been given other related duties in lieu of field sampling for safety reasons.

5. Activities Related to Fisheries Independent Sampling.

   During the current reporting period, the Covid pandemic impacted ongoing fishery independent monitoring activities conducted by the state of Florida. However, Florida has subsequently been able to reinstitute several fishery independent monitoring activities. Completed activities, and summaries of Covid impacts, include:

   - Monthly, long-term estuarine monitoring in five Gulf of Mexico estuaries (Apalachicola Bay, Cedar Key, Tampa Bay and Charlotte Harbor) was suspended in April due to the Covid pandemic. Monthly sampling with 21.3-m seines and 183-m haul seines was phased back in between May and June 2020 with full sampling complement in all estuarine systems by July. Sampling with 6.1-m otter trawls was phased back in during the same time but with a bimonthly periodicity to free up funding to conduct bimonthly polyhaline seagrass monitoring.
   - Bimonthly sampling in Sarasota Bay was not conducted in April 2020 due to Covid pandemic concerns. Sampling was conducted in June and August with funding shifting from a Sarasota Bay Estuary Program grant to internal FWRI funding from October 2020 through September 2021.
   - Supplemental (June – November) polyhaline seagrass monitoring was conducted in five Gulf of Mexico estuaries (St. Andrew Bay, Apalachicola Bay, Big Bend, Tampa Bay, and Charlotte Harbor) using 6.1-m otter trawls; this effort is normally conducted monthly, but due to limitations in available funding, sampling was conducted every other month during 2020.
   - Monthly supplemental sampling in the western Panhandle (Pensacola Bay, Santa Rosa Sound, Choctawhatchee Bay, St. Andrew Bay, St. Joseph Bay) using 21.3-m seines was terminated in 2020 as continued grant funding was not available.
   - The summer SEAMAP groundfish trawl survey was not conducted due to impacts of the Covid pandemic. We do anticipate conducting a fall SEAMAP groundfish trawl using 12.8-m trawls.
   - The annual (May – October) reef fish video and habitat mapping survey was delayed due to impacts of the Covid pandemic; however, we have resumed sampling, and a complete survey was conducted using stationary-baited remote underwater video arrays and side scan sonar to survey artificial and natural reef habitats.
   - Processing of survey-related trophodynamics data in support of ecosystem-based fishery management continued.

During this period, we finalized the development of indices of abundance of video survey data for Scamp and Greater Amberjack in association with SEDAR, and compiled an index of abundance for Gray Triggerfish for an interim analysis. We have begun work in association with the upcoming Gag assessment, which will include both an index of abundance of video survey data as well as an examination of potential red tide impacts.

6. Other State Activities.

Otolith Processing

On March 9th, the FWRI Marine Fisheries Age and Growth lab started the transition into a work-at-home approach to remain on track with processing deadlines. There were varying solutions to ventilation needs required to safely use our liquid coverslip, but a mix of open-air workstations, fans, and even a portable fume hood have all been safely, and effectively utilized. Once safe areas were set up in homes, supplies and equipment were partitioned out to staff so that everyone had an entire lab setup for processing and ageing. Large batches of otoliths were split and assigned to individuals.

Processing and ageing goals are directed on a quarterly basis, but each member completes assignments in their own time and returns to the lab as needed to deliver completed work and grab new samples. Sample batches are reintegrated upon delivery at the lab. Daily progress communications are critical to ensuring there is constant productivity and Microsoft Teams has been essential. We use Teams to QA/QC ageing assignments (live camera from one person on shared desktop), conduct discussions about productivity, challenges and improvements to the offsite system, and do teambuilding activities. As we've progressed into a reopening plan, staff have transitioned to one assigned day a week in the lab embedding small otoliths (which require more chemicals and a stronger ventilation system than can be provided at home). This system works to ensure a constant supply of otoliths available for sectioning at home.

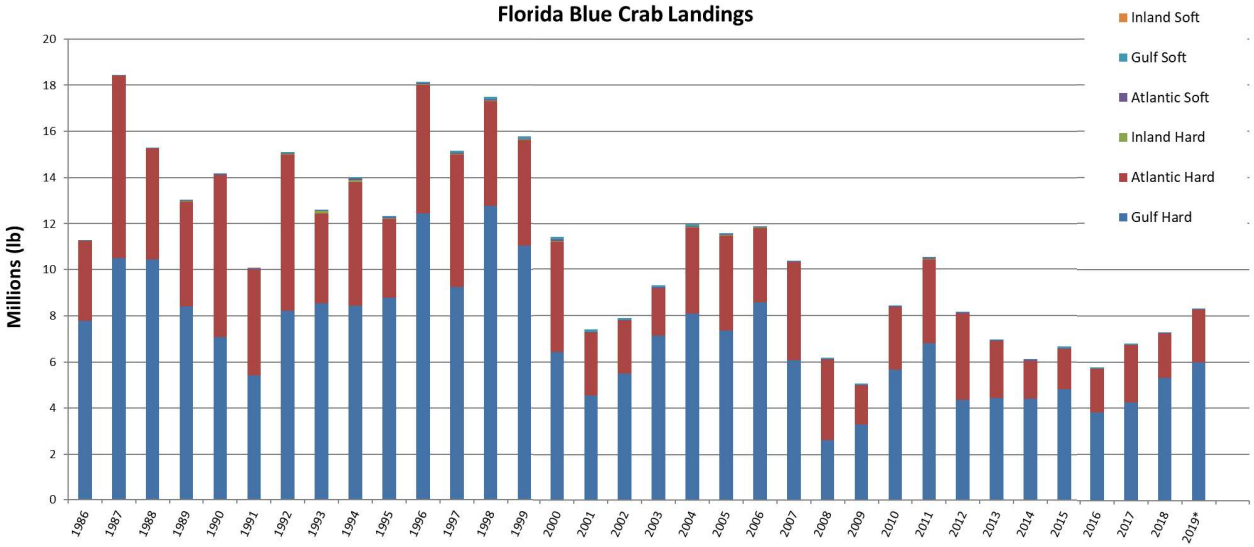
From the start of the offsite transition, the FWRI Age and Growth Lab has processed just over 12,000 and aged nearly 28,000 otoliths. We are on track to have a record ageing year, but a slight reduction in processing. We were able to successfully pivot priorities and turnaround 2019 east coast red snapper ageing for SEDAR73 in the span of a month and a half. We have met all data delivery deadlines and have provided completed ageing for 11 data requests, including multiple SEDARs. Additionally, we've been continuing to collaborate (and publish) with other agencies and universities, have participated in SEDAR68 and SEDAR73, have continued to be active with outreach planning and requests, and provide field assistance and support for our research section. The success of this transition hinges on the flexibility, problem-solving abilities and dedication of our age and growth staff. COVID-19 has been the biggest hurdle ever to cross our paths, but thanks to the hard work and diligence of this team, we've been able to take it in stride and continue moving forward.

Appendix A.

GSMFC Crab Subcommittee
Florida Report
September 2020
Claire Crowley, Ph.D. and Ryan L. Gandy, Ph. D.

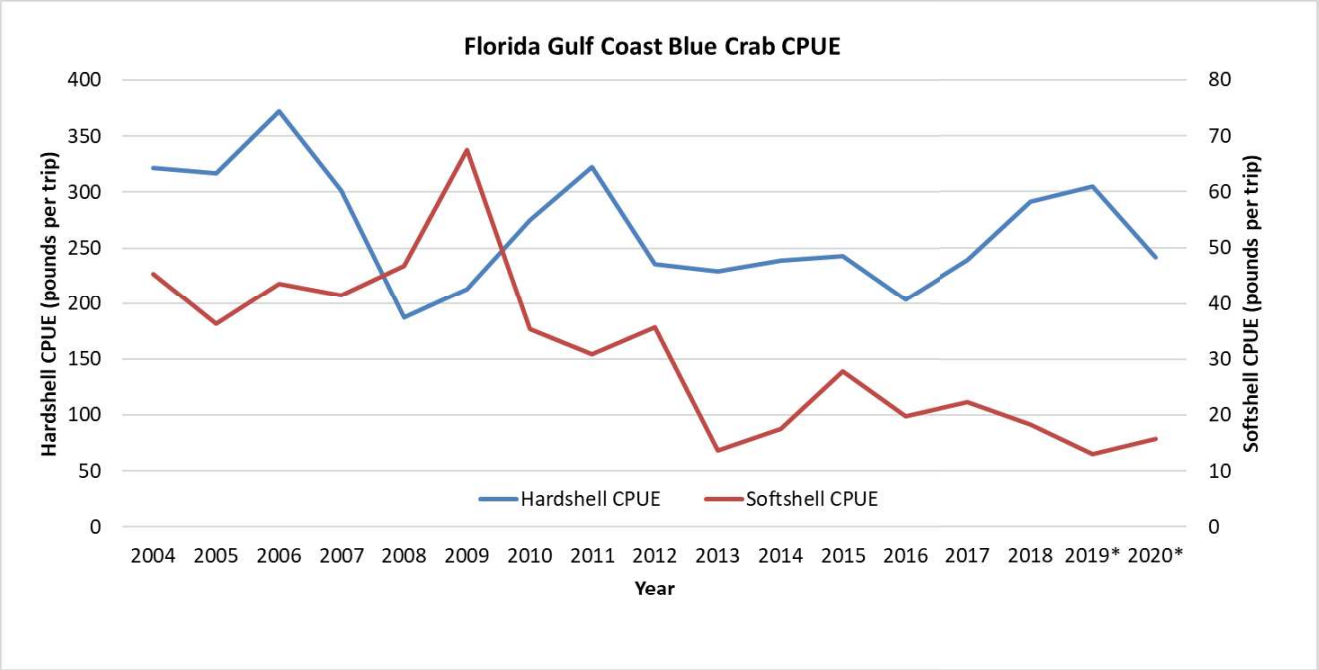
Blue Crab Landings

Florida's blue crab landings through 2019 suggest a continuation of landings volume below its historic average, beginning in 2000. The 2019 landings are the highest since 2012 and appear to follow the historical cycle of 5-10-year intervals of landings "lows" and "highs" (Figure 1). Since 2012, statewide landings have been relatively stable, hovering between 6 -8 million pounds. At the time of this report 2020 blue crab landings were very preliminary and therefore, not included. The catch per unit effort (pounds per trip) in Florida Gulf Coast landings has fluctuated for both hardshell and softshell fisheries, but remained relatively stable since 2013 (Figure 2). Florida does not collect recreational blue crab landings.



*preliminary data

Figure 1. Statewide Florida blue crab landings. Data obtained from Florida Fish and Wildlife Marine Fisheries Information System.



* preliminary data

Figure 2. Florida Gulf Coast blue crab catch per unit effort (pounds/trip). Please note that 2019 and 2020 years are preliminary. Data obtained from Florida Fish and Wildlife Marine Fisheries Information System.

Management Actions

Starting in 2020, all recreational traps used for blue crab and stone crab fishing must be registered with the state. The registration system is an online registration that generates unique tag numbers that the fisher must affix to their traps. Five unique identification numbers are generated for each trap type (blue crab or stone crab) that a registration holder indicates that they intend to fish. This will allow the state to identify gear and provide a population of recreational fishers that will be surveyed in future years to gauge the effort. At the time of this report, there were 29,113 recreational blue crab trap registration holders and 23,530 recreation stone crab trap registration holders.

Petition for use of Terrapin Excluder Devices (TEDs)

The Florida Fish and Wildlife Conservation Commission (FWC) was petitioned by the Center for Biological Diversity, Florida Turtle Conservation Trust, and Diamondback Terrapin Working Group in January of 2020 to protect Diamondback Terrapins (*Malaclemys terrapin*) from mortality in blue crab pots. The FWC Division of Marine Fisheries Management (DMFM) has reviewed the petition and is conducting stakeholder workshops to present potential rule changes that would to reduce possession limits and require the use of bycatch reduction devices (BRDs) in commercial and recreational blue crab traps. If the DMFM decides to move forward with rulemaking changes it will be presented to the commission in December 2020.

Alabama State Report
Gulf States Marine Fisheries Commission's
Fall 2020 – Online meeting

Emerging Issues Pertinent to Gulf of Mexico Fisheries.

1. Regulatory

The Reef Fish Endorsement was promulgated by the Commissioner of the Department of Conservation and Natural Resources last year. The Reef Fish Endorsement will be required for any person possessing, taking or attempting to take any gulf reef fish species listed in Rule 220-3-.46 including all triggerfish, snapper, grouper, tilefish, jacks (includes banded rudderfish but not crevalle jack) wrasses and hogfish. This endorsement is required for all resident and non-resident anglers 16 years of age and older, and includes disabled, veteran's appreciation, 65 and older, lifetime license holders, pier licenses, annual saltwater licenses, trip licenses, commercial fishermen, and charter boats. Nearly 24,000 Reef Fish Endorsements were sold to recreational anglers and 220 and 34 endorsements were associated with charter and commercial vessels, respectively during the first year of the endorsement requirement. The sale of the endorsement will provide a database of addresses/contact information of anglers who target reef fish from which specialized surveys to determine fishing behavior and spending for reef fish fishing activities may be conducted. In addition, the revenue collected from the sale of the endorsement will be used to support future fishery-dependent and -independent sampling activities related to reef fish management.

To help take the guesswork out of purchasing licenses, the Alabama Department of Conservation and Natural Resources now offers packages that cover all of the necessary license requirements needed when hunting or fishing the state's abundant opportunities for freshwater and saltwater species. All packages are available in both a resident and non-resident packages.

Activities Related to Artificial Reef Programs.

Phase II of the National Fish and Wildlife Foundation Alabama Artificial Reef and Habitat Enhancement Project continues to provide funding for reef fish habitat enhancement and monitoring projects in the inshore, nearshore, and offshore waters of Alabama.

The Alabama Marine Resources Division (AMRD) continues to coordinate with BOEM, USACE, and NMFS for authorization to designate approximately 110 square miles of water bottoms as artificial reef zones. A $742,724.42 contract to perform a Phase I cultural resource survey of the proposed water bottoms has been executed and the remote-sensing data collection component is expected to be completed by November 1, 2020, a formal consultation with NMFS is likely to be initiated to evaluate the project's impact on threatened and endangered species.

Approximately 48 square miles between 6 and 10 miles offshore of Baldwin County, approximately 62 square miles between 10 and 20 miles offshore of Mobile County, and four reef sites in Mobile Bay will be enhanced with reef structures to provide habitat for various estuarine and marine reef-associated finfish after federal regulatory requirements are satisfied.

Three circalittoral reef zones offshore of Baldwin County beaches were enhanced with 327 anchored reef modules. A $1,140,000 contract to build, transport, and install the shallow-water, anchored reef modules was executed, and construction was completed in July 2020. The shallow-water reef modules will provide habitat for a wide range of shallow-water reef associated finfish such as Sheepshead, Gray Snapper and flounder.

Activities Associated with the Gulf of Mexico Crab Fisheries.

No derelict trap collection program is scheduled, but AMRD will continue to monitor the number of derelict traps.

Activities Related to Fisheries Dependent Data Collection.

1. APAIS

AMRD continued the collection of dockside Access Point Angler Intercept Survey (APAIS) interviews and validation of charter vessel activity. From January 1, 2020 through August 31, 2020, AMRD samplers completed a total of 264 out of 361 APAIS assignments and out of the completed assignments, 2,260 anglers were interviewed. During the reporting period, a total of 97 of 361 (27%) scheduled assignments were cancelled in response to the COVID-19 pandemic. These cancellations mainly occurred between March and April. Intermittent outbreaks of COVID-19 occurred when sampling resumed in May which resulted in some scheduled assignments being cancelled. Semi-annual training and fish tests were given to APAIS staff in February and August.

2. Biological sampling

AMRD continued operation of the Biological Sampling Program for the collection of otoliths from recreationally harvested marine finfish. Samples were not collected during the last two months of the previous grant cycle (Jan-Feb 2020) due to a lack of funds available at the end of 18-month budget period. Sampling resumed on March 1 with the start of the next funding cycle. From March 1, 2020 through August 31, 2020, a total of 791 sets of otoliths with 57 additional length measurements representing 12 out of 13 primary target species were collected by AMRD's staff. The COVID-19 pandemic impacted biological sampling activities during the

months of March and April resulting in 24 cancelled assignments and a reduction in hard parts collected especially for seasonally caught finfish such as Gray Triggerfish.

3. Snapper Check
Private recreational red snapper landings from Snapper Check through August 31 of the 2020 season was 948,688 lbs. while landings for state charter anglers was 45,404 lbs. Approximately 128,500 lbs. remain in the 2020 quota and a three-day extension is planned for Oct. 10-12. A total of 6,646 vessel landing reports were submitted by private recreational anglers and 537 landing reports were submitted by representatives on state-licensed vessels. Although samplers used caution while conducting sampling activities during COVID-19, over 1,100 Red Snapper from private recreational vessels were weighed from 272 vessels through August 31. An estimated 37.1% of private recreational vessel trips landing Red Snapper in Alabama were reported through Snapper Check. Beginning in 2021, recreational anglers landing Gray Triggerfish or Greater Amberjack in Alabama must report their catches through Snapper Check. Nearly 24,000 Reef Fish Endorsements were sold during the first year. The sale of the endorsement will provide a database of addresses/contact information of anglers who target reef fish from which specialized surveys to determine fishing behavior and spending for reef fish may be conducted. In addition, the revenue collected from the sale of the endorsement will be used to support future fishery-dependent and -independent activities related to reef fish management. Snapper Check continued into October with an extension of the Red Snapper season.

4. Shrimp conversion
The AMRD is participating in a project with the Gulf States Marine Fisheries Commission (GSMFC), other Gulf States, and federal partners to validate commercial conversion factors of processed brown and white shrimp. Samples were collected from Alabama seafood dealers during the report period and data analysis should be completed by December 2020.

Activities Related to Fisheries Independent Sampling.

1. Shellfish
AMRD biologists continue to monitor oyster densities on Alabama's public oyster reefs. From May 28, 2020 through August 11, 2020, a total of 230 SCUBA quadrat samples were collected and processed. Samples were collected from reefs that were planted with cultch between 2013 through 2016 and from non-planted reefs for comparison. Low densities of legal-sized oyster were observed on many of the reefs surveyed though the density of legal-sized oysters increased slightly compared to the 2019 quadrat survey. The densities of oyster spat and sublegal oysters were lower in 2020 than in the 2019 quadrat survey results. The lower spat and sublegal oyster densities are most likely due to extended periods of low salinity caused by fresh water from high rainfall flowing over the main reefs in the spring of 2020. From February 12, 2020 through May 8, 2020 the lower Mobile Bay reefs had 73 days below 5

ppt. There was also a 24-day low dissolved oxygen (<4 mg/L) event between June 19, 2020 and July 13, 2020. Oyster drills were present in quadrat samples but not in high abundance possibly due to the extended fresh water in the spring. Prior to Hurricane Sally, data analysis showed that several areas in the Heron Bay, Cedar Point West, and Cedar Point East management zones had higher densities of legal-sized oysters from previous years. Public reefs were sampled with a hand dredge within two weeks after Hurricane Sally made landfall and samples indicated there was little loss of adult oysters. The 2020 oyster season was to open October 12th. Commercial oyster reef harvest results will be included in the update for spring 2021.

The AMRD obtained Natural Resources Disaster Assessment (NRDA) funding for the construction of an Eastern oyster hatchery and remote larval setting facilities. Construction should begin in spring of 2021 with oyster spat production anticipated spring of 2022.

2. SEAMAP

Spring and summer activities were completed for bottom long line and vertical line surveys. The summer trawl cruise was cancelled due to logistics associated with COVID-19. Staff from Alabama and Mississippi have worked together and completed fall trawl sampling October 1-5 from the Mississippi River to Panama City in an effort to maximize the use of funding. Trawl scientists have participated in an invertebrate identification webinar series (Aug-Sep), in lieu of attending a workshop. Fall bottom longline sampling in waters less than ten meters in depth was completed at three stations during September. Catches across all seasons were comprised of twelve species with Atlantic Sharpnose Shark being the most abundant. Vertical line summer sampling completed 29 stations; catches comprised of seven species totaling 91 fish with Gray Triggerfish and Red Porgy being the next most abundant species after Red Snapper. The AMRD scheduled the Fall SEAMAP ichthyoplankton survey off Alabama for September 2, 2020 but due to the COVID-19 pandemic, NOAA cancelled all ichthyoplankton cruises.

3. Inshore Gillnet

From August 2019-July 2020 gillnet sampling was conducted each month using small mesh perpendicular sets ranging with mesh from 2-4 inches, and large mesh parallel sets ranging with mesh from 4.5-6 inches. A total of 232 hour-long sets were completed with a total of 51 different species sampled comprising 10,411 observed individuals. Weather issues and protected species interaction issues prevented us from completing the full 240 sets normally conducted within a year. Nearly 1,200 otoliths were collected from captured individuals and measurements of corresponding length, weight, sex, and gonads weight were taken. A total of 25 thirty-minute gillnets were set randomly before or after standard hour-long sets to determine the effect on catch rates and whether the sampling protocol can be modified to accommodate shorter net sets. Whole specimens of gilled/wedged Gulf Menhaden were collected at 10 individuals/mesh/month in order to age them through scales by trained staff members.

Species	Caught	Otolith	CPUE
Spotted Seatrout	268	252	1.155
Striped Mullet	261	213	1.125
White Mullet	502	228	2.164
Sheepshead	15*	17*	0.065
Gulf Flounder	0*	2*	0
So. Flounder	3*	10*	0.013
Red Drum	40	31	0.172
Atl. Croaker	372	152	1.603
So. Kingfish	24	22	0.103
Spanish Mackerel	181	140	0.78
Black Drum	34*	39*	0.147
Gulf Menhaden	5501	0	23.711
Red Snapper	0	0	0
Sand Seatrout	78	78	0.336
Lane Snapper	0	3	0
Gray Snapper	8	6	0.034
Bluefish	2	1	0.009
Cobia	1	1	0.004
Tripletail	1	1	0.004
Fl. Pompano	5	3	0.022
Total	**7296**	**1199**	

Combined catch from AMRD fishery independent gillnets in FY2019, 116 small mesh (2"-4") sets and 116 large mesh (4.5"-6") sets. **Additional otolith samples collected from fishery-independent trawls.*

Other State Activities.

1. Mariculture

Stock enhancement efforts continued at the Claude Peteet Mariculture Center (CPMC). Approximately 10,300 Florida Pompano (*Trachinotus carolinus*) and 58,400 Spotted Seatrout (*Cynoscion nebulosus*) were released into coastal Alabama waters between April 1st – September 30th. Although staffing of the hatchery was impacted by Covid-19, most operations were still able to take place. An additional thirty-five Southern Flounder (*Paralichthys lethostigma*) broodstock were collected from a local fishing tournament and a jubilee event. Spawning activities for Southern Flounder will resume in December of 2020.

In addition to fish culture activities, the CPMC staff completed the renovation of broodstock rearing systems. The intent was to use these systems to increase broodstock maturation capabilities to improve the chance of spawning success. Unfortunately, Hurricane Sally destroyed the greenhouse structure housing the systems, rendering them unusable for the time being.

2. Boating Access
The AMRD has plans to improve the parking area at Delta Port boat launch in Fiscal Year 2021 to maximize available space for parking. In addition, the boating access facilities at Little Billy Goat Hole boat ramp on Dauphin Island and the boat ramp at the Bayou La Batre State Docks will be improved in FY2021.

3. Outreach
The AMRD Fisheries section was able to conduct one outreach event during the report period. Typically, during this time period five outreach events are conducted including Delta's Woods and Water Expo and Gulf State Park's Shark Week. However due to the COVID-19 pandemic, these events were canceled. The Alabama Seafood Marketing Program continued with public relations, television commercials, print ads and articles, radio ads, billboards, distribution of marketing materials and sponsorships of events. The marketing program's website is www.eatalabamaseafood.com.

4. Enforcement
From February 2020 through August 2020, AMRD enforcement officers conducted 1,192 commercial fishermen intercepts, 9,056 recreational fishermen intercepts, 700 seafood dealer and processor inspections, 8,239 hours of patrol (combined vessel patrol and shore patrol) and boarded 2,928 vessels.

Due to the Covid-19 pandemic, the Enforcement Section's participation in outreach events has been greatly reduced. The Enforcement Section has managed to participate in two live outreach events during this time, both were quite successful considering the circumstances.

In May 2020, the Enforcement Section received final approval to move ahead with implementing the expansion of the Coastal Remote Monitoring System that was partially paid for with Port Security Grant 2018 funding, totaling more than $313,000. This expansion will update and expand the capabilities of the current system, a network of video cameras throughout coastal Alabama. Several new camera locations as well as higher resolution cameras along with a more robust communications system will be coupled with a much larger storage capacity that provides a much higher quality video as well as the ability to store the video archives longer. The construction and additions to the current system under this phase of enhancement were completed in August 2020.

The Enforcement Section, along with the Fisheries Section, was awarded a grant that will be used for both monitoring and protecting marine mammals and marine turtles. This grant will provide specialized monitoring equipment to monitor turtle nesting areas and established nesting sites. Along with turtle nesting and protection, the grant provides funding to educate the public about marine mammal interactions with people and to help enforce current laws related to this interaction. The award will provide remote cameras that are solar/battery-powered that feed into

our existing monitoring system. These cameras will help track turtle movement and also monitor known nesting sites. Also, the grant provides funding for personnel and equipment to enhance public education on both marine mammals and marine turtles.

Derelict Trap Retrieval Program

The trap retrieval program continues to operate on the Gulf Coast during odd numbered years, and the Atlantic coast during even numbered years. Prior to derelict trap collection regions are closed to all trap fishing and all "actively fished" traps must be removed by recreational and commercial fishers. It is common for trap closures to be cancelled to alleviate economic hardships associated with hurricanes, red tides, or lack of derelict gear present. In 2019, 685 blue crab traps were collected along the Gulf Coast of Florida and through Broward county. The ratio of commercial to recreational traps was unavailable.

Gulf States Marine Fisheries Commission
Technical Coordinating Committee
Mississippi State Report (January1, 2020 – June 30, 2020)

1. Emerging Issues Pertinent to Gulf of Mexico Fisheries

Bonnet Carré Spillway Opening

The Bonnet Carré Spillway, located in Norco, Louisiana, is used to divert flood waters of the Mississippi River through Lake Pontchartrain and Lake Borgne into the Mississippi Sound. The US Army Corps of Engineers' (USACE) operates the spillway when river flows at New Orleans are at 1.25 million cubic feet per second. The USACE opened the spillway on April 3, 2020 through May 1, 2020.

In May of 2020, the United States Secretary of Commerce allocated $21,311,804 in fishery disaster funding to Mississippi to help businesses and individuals recover from the unprecedented freshwater flooding caused by the 2019 opening of the spillway. Spending plans for these funds are currently in development.

Oyster Impacts

As a result of the 2019 spillway openings, the oyster resources in the western Mississippi Sound experienced near 100% mortality, which was followed by little to no recruitment of spat to aid in the recovery of the oyster resources. Subsequent efforts by Shellfish Bureau (SB) staff to collect oyster samples to monitor the effects and recovery of oysters affected by the 2020 opening of the Bonnet Carré Spillway were minimized, since the resource had not shown many positive indications of recovery. Oysters were sampled across all major reefs in the Mississippi Sound. Traditionally oyster samples are collected through two methods: square meter dive and one-minute dredge tows. Due to the early season spillway opening and colder water temperatures throughout the Mississippi Sound, square meter dive samples could not be collected until later in the year. In April and June, Staff collected 21 one-minute dredge tow samples and analyzed the data to track oyster mortality, condition, and recruitment. Overall, the oyster resources in the western Mississippi Sound indicated no new recruitment of spat while experiencing additional mortality at a rate of between 75-90% mortality across all size classes of remaining oysters. Oyster mortality in the eastern Mississippi Sound was observed to be within the range of what would be considered normal, natural mortality. Some new recruitment of spat was observed in the samples collected from the eastern Mississippi Sound; however, recruitment was minimal.

Shrimp and Crab Impacts

In response to the 2020 openings of the Bonnet Carré Spillway, Shrimp and Crab Bureau (SCB) staff completed 29 trawl samples and 32 hydrological condition samples in the western Mississippi Sound from April to May. These data are important in monitoring potential short-

term trends in abundance during and immediately following spillway operation. Hydrological data including salinity, temperature, turbidity, and dissolved oxygen were collected at the surface and bottom at each station during each sampling event.

COVID-19

The emergence of a global pandemic in the Spring of 2020 negatively affected multiple stakeholders of Mississippi's marine fisheries. The Coronavirus Aid, Relief and Economic Security (CARES) Act appropriates $1,520,087 to fisheries participants suffering economic losses greater than 35% compared to the previous five-year average. MDMR is currently developing a spending plan for these funds.

2. Activities Related to Artificial Reef Programs

The Artificial Reef Bureau (ARB) continued monthly monitoring of fish assemblages and physiochemical parameters at selected inshore reef sites. ARB staff collaborated with the Mississippi Gulf Fishing Banks to monitor artificial reefs via roving SCUBA diver surveys. Divers conducted 12 surveys January through June 2020. In conjunction with the Gulf States Marine Fisheries Commission (GSMFC), the third annual Jimmy Sanders' Memorial Lionfish Challenge began May 1, 2020 and will run through December 1, 2020. Biological data as well as harvest location are collected for each fish.

ARB staff continued efforts to renew permits for all nearshore artificial reefs, keys, and the Cat Island artificial reef zone.

3. Activities Associated with the Gulf of Mexico Crab Fisheries

Escape Rings and TED's

Utilizing NOAA Fishery Disaster funds from the 2011 opening of the Bonnet Carré Spillway, the MDMR has been able to provide 71,984 crab trap escape rings and 7,216 terrapin excluder devices (TED's) at no cost to resident crab fishermen. Two thousand forty-two escape rings and 144 TED's were distributed between January and June 2020.

Terrapin Interactions

Staff continued to manage the Terrapin Reporting App program through March 31, 2020 when the program was completed. The app was used to collect information from the commercial Blue Crab fishery on observations of diamondback terrapins. The program included 34 participating commercial crab fishermen who provided data to MDMR staff through a mobile app on number of traps fished, fishing location, soak time, and if terrapins were observed. Approximately 576 reports were submitted by participants from January to March 2020 and approximately 6,048 reports were submitted since the project began in October 2017.

Red Drum Stomach Content Analysis

The SBC has been analyzing stomach contents of Red Drum to better understand the percentage of their diet that consists of Blue Crab. This project provides data on the current foraging habits by size class, habitat type and time of year. To date, a total of 699 Red Drum have been sampled and processed (length, weight, sex, and age). Stomach content analysis has been performed on 483 Red Drum, ranging in size from 199 - 1126 mm total length (TL). Of the stomachs examined, 372 (77.0%) contained prey items that were identifiable to the lowest possible taxa. The stomach contents of all size classes (juvenile n = 125, sub-adult n = 108, adult n = 139) consisted primarily of fishes and decapod crustaceans. A very small number of gastropods, mollusks, and echinoderms were identified but not included in the analysis as they were considered subsidiary forage items. This project is currently in the final analysis and reporting phase, and MDMR staff plans to complete the project by December 2020.

4. Activities Related to Fisheries Dependent Sampling

MRIP

The Finfish Bureau (FB) continued to oversee the Marine Recreational Information Program (MRIP) in Mississippi. A total of 182 assignments and 918 surveys were completed January through June 2020 in Jackson, Harrison, and Hancock Counties. Survey site validations were conducted at all active sites to update the site registry for 2020 as state-wide site effort estimates continue to be refined and edited to better reflect the most recent and updated charter for-hire license database. This will allow FB staff to develop a more comprehensive and accurate active vessel frame to estimate for-hire effort more precisely.

Trip Tickets

FB collected commercial landings data from processors, dealers and fishermen utilizing the Mississippi Trip Ticket program. This data allows management of the resource and effective monitoring of the quota on Red Drum, Spotted Seatrout, and Southern Flounder. From January through June 2020, there were 2,507 paper and electronic trip tickets submitted. Mississippi currently has 278 active commercial fishermen and 58 dealers participating in the trip ticket program. The current number of commercial fishermen selling their own catch using a Fresh Product Permit and participating in the trip ticket program is 49. The FB is continuing to work with BlueFin Data developing the electronic trip ticket reporting application known as VESL. Currently, a beta version is being tested by select dealers. A final version is expected to be available by the end of 2020.

Age and Growth

The FB collected and processed 94 otoliths as part of the MDMR biological sampling program from eight species: Gray Snapper, Red Snapper, Sand Seatrout, Spotted Seatrout, Southern Kingfish, Sheepshead, Striped Mullet, and Southern Flounder.

Tails 'n' Scales

Mississippi's recreational Red Snapper electronic reporting system, Tails n' Scales was updated for use in the 2020 season. Under amendment 50c passed by the Gulf of Mexico Fisheries Management Council, Mississippi managed the 2020 recreational Red Snapper season in state and federal waters. The state charter for-hire and private recreational components were managed together this year with a season opening date of May 22nd. The federal for-hire season was 62 days, although vessels with federal reef fish permits were not included under amendment 50c. Mississippi's total annual quota is 151,584 pounds for both the private recreational and state charter for-hire components.

5. Activities Related to Fisheries Independent Sampling

Finfish Sampling

Long-term fishery independent sampling continued in conjunction with the NOAA Project "Monitoring and Assessment of Mississippi's Interjurisdictional Marine Resources". The FB completed 56 gill nets at ten stations to collect finfish species for subsequent age and growth analysis as well as other biological data. A total of 280 otoliths were collected from January through June 2020 and samples were collected from ten different species: Gray Snapper, Black

Drum, Red Drum, Sand Seatrout, Spotted Seatrout, Southern Kingfish, Striped Mullet, Sheepshead, Spanish Mackerel, and Southern Flounder.

Through a project funded by the USFWS Sport Fish Restoration Program, the FB analyzed data from ten pop-up satellite tags that were deployed on Atlantic Tripletail in the fall of 2019. Data analyzed included fish movements, water temperature and depth usage for each satellite tag deployment.

The Fyke Net sampling program, used to target Southern Flounder, resumed in May 2020 and will continue through November. Traps were set and retrieved from three stations (Deer Island, Belle Fontaine Beach, and Davis Bayou). A total of eight sampling events occurred within the timeframe, and 18 Southern Flounder were collected. Other species observed in the traps include Blue Crab, Hardhead Catfish, Red Drum, Spotted Seatrout, Atlantic Croaker, Black Drum, Spot, Southern Kingfish, Atlantic Spadefish, Gray Snapper, Sheepshead, Striped Mullet, and Atlantic Stingray.

The FB, in conjunction with the Gulf Coast Research Lab (GCRL), is currently in year five of sampling for the NFWF Reef Fish project. Due to impacts from COVID-19, both entities were forced to engage in limited sampling efforts throughout the timeframe. From March through June, 34 sites were sampled by MDMR and 18 sites were sampled by GCRL for a total of 52 sites.

Shrimp and Crab Sampling

The SCB continued to conduct monthly fishery independent trawl sampling under the project "Monitoring and Assessment of Mississippi's Interjurisdictional Marine Resources". This sampling program includes six fixed stations located along a transect from western Horn Island to Bernard Bayou, and eight fixed stations in the western Mississippi Sound from Gulfport to Heron Bay. A total of 84 trawls were completed from January to June 2020.

The SCB continued fishery independent trap surveys for Blue Crabs within the three major bay systems – St. Louis Bay, Biloxi Bay, and the lower Pascagoula River. Each bay system was sampled monthly from January to June 2020 for a total of 18 sample sets. This program, which began in 2015, provides data on CPUE, sex composition, abundance of Blue Crabs, and bycatch composition.

Shellfish Sampling

The Shellfish Bureau conducted an annual oyster stock assessment of 14 reef complexes located in the Mississippi Sound between the mouth of the Pearl River and the Pascagoula River. Reef assessments help to determining a sustainable harvest, monitor predation and disease, calculate mortalities and recruitment, record environmental conditions including

hydrology and bottom type, and determine where and how to focus future restoration efforts. Square meter dive samples are employed to provide a quantitative assessment of each reef across the entire spectrum of oysters' sizes to achieve the assessment goals. Random points were selected for each reef based on reef size and reef density variations. A total of 98 sampling locations were created with 2 replicate dives performed at each location for a total of 196 square meter samples across the 14 reefs. Data is currently being analyzed for the 2020 oyster reef assessment.

6. Other State Activities

State Records for Recreational Fishing

A total of 11 recreational fishing records were approved as state records between January 1 and June 30, 2020. An all tackle category was added and had five approved record submissions: Red Hind (spear), Spanish Hogfish (spear), African Pompano (spear), Ocean Triggerfish (spear), Highfin Goby (castnet). There were four Conventional Tackle approved record submissions: Knobbed Porgy, Spanish Flag, Yellowfin Tuna, Ladyfish. There were also two Youth Records approved during the timeframe: Vermilion Snapper and Spotted Seatrout.

Shrimp Studies

The SCB participated in a GSMFC funded research project to develop more accurate weight conversions for commercially important shrimp species. The project included procuring samples from the shrimp industry, collecting head-on, head-off, and pealed/deveined weights and lengths and determined conversion factors by species and count size. SCB staff processed a total of 1,046 shrimp. Sample collection continued through June 2020, and the project is planned to be completed by December 2020.

Shrimp Inspections and Permits

The SCB manages the live bait shrimp licensing program. Inspections and technical assistance were provided, as needed, to the 10 licensed dealers across Mississippi's three coastal counties. The SCB also manages the MDMR Special Permitting program which includes Scientific Research Permits, Brood Stock Permits, Non-profit Harvesters Permits, and Experimental Gear Permits. SCB staff issued 25 Special Permits from January to June 2020.

Oyster Aquaculture

The MDMR began training the third class of Off-Bottom Oyster Aquaculture Program (OBOA) in 2020. The class teaches potential and current commercial oyster farmers the basics of off-bottom oyster aquaculture. Topics in the course include oyster biology, hatchery basics, nursery options, seed handling, farm site selection, overview of off-bottom culture gear, methods to control fouling, splitting, and grading, business planning, risk management, permitting, public health considerations and marketing. Twenty-two participants are currently enrolled in the program and approximately 250,000 oysters are being grown through the program. Private lease applications are currently being submitted to Mississippi's Secretary of State for approval. Twenty-six participants from the first and second OBOA class have signed Public Trust Tidelands Sub-leases for a total of 55 acres leased inside the MDMR Commercial Aquaculture Parks. Commercial operations harvested approximately 430,000 oysters in 2019 and 2020.

Shellfish Management

The goal of the shellfish sanitation and compliance program is centered on monitoring fecal coliform indicator organism levels within shellfish growing waters. Routine sampling of shellfish growing waters and investigative sampling of consistent fecal coliform hotspots help minimize the risk of seafood borne illnesses and aid in determining sources of pollution along the coast. SB staff and an FDA certified lab work within the guidelines of the National Shellfish Sanitation Program Model Ordinance, to meet this goal. A database of all lab analyses is maintained and used during annual evaluations of all shellfish growing waters in Mississippi as required by this same document. From January 1 to June 30, 2020, 392 routine samples, two hatchery samples, and 75 investigative samples were collected. The Mississippi Coast is split into eight different growing water areas. Each area is sampled once a month throughout the year. The state-run aquaculture hatchery, located adjacent to the Gulfport Harbor, also collects samples to determine how fecal coliform levels affect oyster settling. Investigative sampling occurs at a location that has a history of high fecal coliform levels and not open to shellfish harvest. SB staff take samples at multiple sites several times during a 12-hour period. This sampling is conducted to determine where the pollution source is located and how the polluted water moves in relation to the oyster resource location.

Seafood Technology Bureau

The Seafood Technology Bureau (STB) conducted a total of 179 inspections (routine, follow-up, and certification inspections). A total of 59 sanitation and Hazard Analysis Critical Control Point (HACCP) deficiencies were cited. The required bi-annual water quality sampling for seafood processing facilities for March was completed with a total of 40 samples taken.

All interstate and intrastate oyster shipping/processing operations were re-certified except for one facility. This was due to travel restrictions per the coronavirus (COVID-19). FDA extended

certification for the facility to April 2021. On-site inspection will be conducted when possible. Staff distributed over 200 personal protective equipment (masks) to the seafood industry.

The STB originally planned to host five HACCP workshops and two Sanitation Control Procedures (SCP) workshops in 2020. As of June, only one class was completed with 15 participants. Due to COVID-19 restrictions, several workshops had to be cancelled (one HACCP and one SCP).

Gulf States Marine Fisheries Commission
Technical Coordinating Committee
2020 Louisiana Fall State Report

Contents

Emerging Issues Pertinent to Gulf of Mexico Fisheries

COVID-19 / CARES Act

The World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020. COVID-19 directly affected the United States (US) economy due to Stay at Home orders and the closing of all nonessential businesses. The US government acted quickly to assist the public when Congress passed the CARES Act and it was signed into law by President Trump n March 27, 2020. The CARES Act was an over $2 trillion economic relief package that contained $300 million for the US Secretary of Commerce to provide to affected fishery participants. Louisiana is to receive a total of $14,785,244 in economic assistance for eligible fishery participants. The GSMFC will administer economic assistance to the eligible participants in LA through direct payments based on the approved LA Spending Plan.

Oyster Lease Moratorium

The Louisiana Wildlife and Fisheries Commission (LWFC) has approved a notice of intent for lifting the oyster lease moratorium. This public comment period has passed and the new regulations have been ratified. Currently, LDWF is coordinating with the Office of State Lands (OSL) and the Coastal Protection and Restoration Authority (CPRA) to work through Phase 0 oyster lease applications which is expected to conclude in the third quarter of 2021.

Activities Related to Artificial Reef Programs

Offshore

LDWF's Artificial Reef Program continues to assess and permit reef deployments related to offshore oil and gas structures. The Program has accepted four new structures. There are 38 structures permitted for deployment as permanent artificial reefs, and one new reef site has been recently proposed. Permitting of an additional 4 structures is currently underway. The Program also has a permit to reef a vessel in its Main Pass 300 Reef.

Multi-beam surveying of the Program's offshore reefs is ongoing (annually) and is available on the Program's website. The Program has completed two pilot projects using remotely-operated vehicle (ROV) surveys to sample offshore reefs and is developing plans to create a comprehensive biological monitoring Program for these reefs.

Inshore

LDWF's Artificial Reef Program surveyed and accepted four new inshore artificial reefs that were completed through a cooperative endeavor agreement with the Lake Pontchartrain Basin Foundation. The new reefs are located in the Biloxi Marsh area and were created using a combination of shell, limestone, and reef-ball materials. Two reef sites, Point Mast and Bird Island, were enhanced using 4,000 tons of limestone each and utilized NRDA Recreational Use funds to complete the project. The Program continues to hold a permit to enhance the Independence Island artificial reef site with 15,000 tons of material through NRDA Recreational Use Restoration funding.

Nearshore
LDWF's Artificial Reef Program enhanced the Ship Shoal 26 (the Pickets) reef site using 8,000 tons of limestone. The Grand Isle 9 reef is permitted and under contract. Ship Shoal 26 and Grand Isle 9 will be completed using Recreational Use Restoration funding. The Program is finalizing the acceptance of four new nearshore reefs: The Ship Shoal 94 and 108 and Vermilion 119 and 124 reefs were deployed with funding from the Artificial Reef Fund. Vermilion 119 and 124 were done in partnership with Coastal Conservation Association of Louisiana. The Program reached an agreement with CCA to enhance one existing reef and create two new reefs.

Monitoring
Through funds provided by the Louisiana Restoration Area Trustee Implementation Group, LDWF continued the monitoring of all completed inshore and nearshore artificial reef enhancement sites. This is part of a 5-year plan to assess the success of artificial reefs enhanced in an effort to mitigate for recreational use opportunities lost during the Deepwater Horizon Oil Spill. Monitoring efforts include the study of the aquatic organisms utilizing the reef enhancement sites via the use of gillnetting, rod and reel sampling, and benthic tray observations, as well as observations of recreational users. Together, those efforts are intended to provide insight into the overall biological health of the reef enhancement sites as well as insight into whether those sites are providing enhanced recreational opportunities to the public.

Activities Associated with the Gulf of Mexico Crab Fisheries

Policy and Regulations

After the completion of the 2016 Louisiana blue crab stock assessment, the Louisiana blue crab stock was identified as overfished. This information, along with management options, were presented to the LWFC who set in rule a three-year plan that would reduce the overall harvest of blue crab in state waters and temporarily reduce harvest pressure. During these three years (2017-2019), monthly closures or a temporary ban on female blue crab took place. The most recent (2019) Louisiana blue crab stock assessment indicated that the Louisiana blue crab stock was not identified as overfished nor experiencing overfishing. Due to the improvement in stock status, no additional regulations were implemented during the 2020 harvest year.

Derelict Crab Trap Program

During the defined 2020 derelict crab trap cleanup areas, the LDWF, contractors, and volunteers successfully removed nearly 4,188 traps across Louisiana's coast. The two Pontchartrain cleanup areas netted a total of 3,387, which was the largest number of traps removed from any one basin. These high numbers come from a successful and ongoing partnership with the Pontchartrain Conservancy, who is contracted by LDWF to remove traps from within the Pontchartrain Basin. Cleanup results in the Vermilion-Tech and Terrebonne Basins netted 171 and 110 traps, respectively. A volunteer day was held during the Barataria

and Calcasieu Basin cleanup events. During the Barataria volunteer day, the event hosted nearly 50 individuals and nine vessels, which resulted in the removal of 362 traps. The Calcasieu volunteer event had around 40 individuals and eight vessels. The team of volunteers and LDWF staff were able to remove nearly 160 traps, which was extremely impressive for an area that was comprised of open water.

Sustainability

In December 2019, the Louisiana blue crab commercial trap fishery underwent the third surveillance audit against the Audubon Nature Institute's Gulf United for Lasting Fisheries Responsible Fisheries Management Standard v1.2. During this audit, the two remaining non-conformances were closed and the Louisiana blue crab commercial trap fishery was granted continued certification in the January 2020 final assessment.

In June 2020, the Louisiana blue crab commercial trap fishery underwent the second surveillance audit against the Marine Stewardship Council Management Standard v2.0. During this audit the final remaining non-conformance was recommended to be closed. The final assessment report should be complete in July 2020.

Stock Assessments

No formal stock assessment was completed for the Louisiana blue crab stock in 2020. Blue crab indices of abundance and model estimates were developed to assist with the two sustainability certification audits. Indices for adult and juvenile blue crab decreased slightly, while young of the year saw an increase. Model estimates indicated that the Louisiana blue crab is not overfished or experiencing overfishing.

Landings

Blue crab landings from January – June in 2020 totaled 14.6 million pounds with a dockside value of approximately $28.8 million. Landings in 2020 showed a decrease of nearly 15% when compared to the five-year average (2019-2015), while the 2020 dockside value increased by 3.5 percent. Landings in four years out of the five-year average were above 16 million pounds (2015-2018), while 2019 had landings slightly above 15 million pounds. The reduction in 2019 landings were primarily due to the historic flooding events that took place during the first 7 months of 2019. Blue crab landings in 2020 were even less than those in 2019, which is likely related to the global pandemic, COVID-19. COVID-19 has caused a direct negative affect on the Louisiana blue crab industry by reducing the market need for fresh, frozen, or canned blue crab products due to restaurant closures and limited supplies at grocery stores.

While COVID-19 negatively affected blue crab landings, it drove the prices for blue crab up. This can be seen when comparing the dockside value or price per pound. As mentioned above, the overall 2020 dockside value increased by 3.5 percent compared to the five-year average, while the price per pound increased by 17 percent. The $1.97 average price per pound from January – June 2020 is the highest price per pound observed over this time period during the six-year time frame (2015-2020). The closest average price per pound to 2020 was in 2015 when blue crab sold for $1.86.

Activities Related to Fisheries Dependent Data Collection

LA Creel

Through the LA Creel program, 5,982 recreational fishing trips, comprised of 16,046 individual anglers, were surveyed during 2020 Sample Weeks 1 – 26 (December 30, 2019 – June 28, 2020). Fifty-two different interviewers completed 784 of the 800 assignments as drawn during the sample period.

Fish kept by anglers and allowed to be viewed by interviewers are referred to as observation Type 1 fish. Fish in possession of the angler at the time of survey but not seen by the interviewer are classified as observation Type 2 fish. For the sample period as above, there were 27,905 Type 1's and 25,768 Type 2's, which equates to 52 percent of all fish in possession of the angler at the time of survey were identified and counted by staff. Type 1 fish numbers are down due to COVID-19 restrictions.

Sixty-nine species were represented among Type 1 fish, including some shellfish. Spotted Seatrout was the most commonly counted species with 22,928. Red Drum was second with 6,905 counted and Sheepshead was the third most common with 3,365 counted.

Fish returned to the water or caught and used for bait are also recorded for certain species. Those species are:

1. Black Drum
2. Gray Snapper
3. Gray Triggerfish
4. Greater Amberjack
5. King Mackerel
6. Largemouth Bass
7. Red Drum
8. Red Snapper
9. Sheepshead
10. Southern Flounder
11. Spanish Mackerel
12. Spotted Seatrout

Fish thrown back because they were under the legal minimum length are coded as Type 3. Fish caught and used as bait during the trip are coded as Type 4. Fish thrown back or given away prior to interview for any reason not covered by codes 3 and 4, such as too big, not wanted, etc., are coded as Type 5. Discard data is collected as per the Department's contract with GSMFC. During the same time period as provided above, staff recorded 29,545 Type 3's, 13 Type 4's, and 3,625 Type 5's.

To generate harvest estimates, angler effort must be determined. LA Creel uses two separate surveys for the purposes of determining angler effort. One survey targets charter captains in which ten percent of the approximately 700 charter license holders and thirty percent of the approximately 100 charter license holders who also have a Recreational Offshore Landing Permit (ROLP) are drawn at random each sample week. The ROLP is a free permit that is required to possess tunas, billfish, swordfish, amberjacks, groupers, snappers, hinds, cobia, wahoo, and dolphinfish in Louisiana waters. The purpose of the ROLP is to increase the chances of drawing anglers who fish offshore for effort surveys. During a red snapper season (federal and/or state), one hundred percent of ROLP holding charter captains are drawn. Department staff attempt to contact drawn captains to ask about the number of charter trips taken during the sample week, how many paying customers where on each trip, and in what basin the trip occurred.

During 2020 Sample Weeks 1 – 26, a total of 2,294 captains were drawn, with replacement. Of those, a total of 1,629 captains (71%) completed the survey.

The other effort survey pertains to private anglers exclusively. Each sample week, not including weeks that fall within red snapper seasons, a total of 1,600 Louisiana recreational saltwater fishing license holders are drawn at random for participation in the effort survey. Twelve hundred of the 1,600 is derived by drawing 300 licensed anglers from each of the four regions La Creel uses to generate landings estimates. A separate random selection of 400 is made from ROLP holders. During red snapper seasons the number of private ROLP anglers drawn for the effort survey increases from 400 to 800. A service contracted by the Department is tasked with contacting drawn license holders to ask questions, such as basin fished in, number of trips taken, about any saltwater fishing trips they may have taken during the sample week.

During 2020 Sample Weeks 1 – 26, a total of 44,400 Louisiana recreational saltwater fishing license holders were drawn, with replacement. Of those, a total of 22,349 (50%) completed the survey. The estimated number of saltwater fishing trips taken during the time period was 1.3 million.

The iPad application used for data entry for dockside surveys was to undergo a rebuild in the spring of 2019, but was pushed back to the spring of 2020. The contractor hired to perform the rebuild finished their work as scheduled. As of now, the app is awaiting approval by the state's Office of Technology Services prior to distribution to field offices for implementation.

Age and Growth

Since the new BIOFIN agreement covers recreational species only, LDWF's Age and Growth Lab in Baton Rouge relies on the National Oceanic and Atmospheric Administration's (NOAA) TIP sampling for commercial otoliths. The lab has processed recreational, commercial and independent otoliths during 2020. From January 1, 2020 through June 20, 2020, the lab has received 4,970 recreational marine fisheries otoliths and aged 4,838 of these otoliths. All otolith

collection and ageing data has been transferred to GSMFC through the month of June. Staff are currently completing July 2020 otolith processing.

LDWF's Fisheries Research Lab in Grand Isle processes yellowfin tuna otoliths, which are not included in the age and growth lab's total for this time period. During the period of January 1, 2020 through June 20, 2020, a total of 49 yellowfin tuna otoliths have been collected and 49 have been aged.

Otolith totals are as follows:

- Black drum – 109
- Cobia – 3
- Gray snapper – 23
- Greater amberjack – 3
- Gray triggerfish – 0
- King mackerel – 0
- Red drum – 709
- Red snapper – 340
- Sheepshead – 195
- Southern flounder – 157
- Spotted seatrout – 1,125
- Striped mullet – 0
- Tripletail - 3
- Vermilion snapper – 21
- Blackfin tuna – 0
- Yellowfin tuna – 49

Commercial Shrimp, Oyster, and Crab Seasons and Landings

Shrimp

The portion of state offshore, or outside, waters between Calliou Boca and the Atchafalaya River Ship Channel at Eugene Island opened on April 17, 2020. Following this opening, the 2020 spring inshore shrimp season from the Mississippi/Louisiana state line westward to Freshwater Bayou and the remaining portion of state offshore waters between the Atchafalaya River Ship Channel at Eugene Island and Freshwater Bayou opened May 18, 2020 at 6:00 am. The remaining portion of state inshore waters from Freshwater Bayou westward to the Louisiana/Texas state line opened on May 27, 2020 at 6:00 am.

Shrimp landings (all species combined and heads on unless specified otherwise) between January – June 2020 totaled approximately 20.9 million pounds with a dockside value of $26.5 million. The 2020 shrimp landings during this period decreased by 48 percent compared to the five-year average, while the dockside value decreased by 42 percent. While overall numbers in 2020 were low compared to the five-year average, the shrimp average price per pound in this period was 9 percent above the five-year average. Louisiana brown shrimp landings during the

time period mentioned above in 2020 were one of the lowest on record. Approximately 8.7 million pounds were landed in 2020 compared to a five-year average of nearly 22.9 million pounds. Brown shrimp landings were also low in comparison to previous years in 2019 due to the 2019 flooding events, but 2019 brown shrimp landings were nearly twice those observed in 2020. These low brown shrimp landings are the result of several factors: early May cold fronts, an early June tropical storm, and COVID-19. The shrimp average price per pound, similar to blue crab, was above the five-year average.

White shrimp landings in 2020 showed a less dramatic decrease than what was observed for brown shrimp. Landings from January – June in 2020 were 12 million pounds with a dockside value of $18.7 million. White shrimp landed during this period of 2020 were 28 percent lower than the five-year average, while the average dockside value was nearly 35 percent lower than the five-year average. The average white shrimp price per pound was also lower than the five-year average by nearly $0.20. Direct reports from industry members stated that larger shrimp that were normally sold during January – May were not in demand because of restaurant closures due to COVID-19. This meant that an abundance of large shrimp was still being held in cold storage and it was a risk to purchase additional product.

Blue Crab

Described in the Activities Associated with the Gulf of Mexico Crab Fisheries section above.

Oyster

Oyster landings, both public and private from January – June in 2020 totaled 1.7 million pounds(meat weight) with a dockside value of approximately $12.4 million. Landings in 2020 showed a decrease of 74% when compared to the five-year average (2019-2015), while the 2020 dockside value decreased by 71 percent. The 2019-20 public oyster season opened November 1, 2019. The table below summarizes the 2019-2020 oyster season to date for Louisiana's major public oyster areas. This year, the goal was to reduce harvest stress as a means to conserve remaining resource from the 2019 flooding event, and manage areas as recommended by the shell budget model thresholds—all of which should help minimize reef degradation.

2019-2020 LDWF Oyster Season Summary						
Area	Season Opening	Season Closure	Season/type	Days open	Harvest	CSA
POSG East of Mississippi river and North of MRGO	closed					1
POSG East of Mississippi river and South of MRGO	closed					
Hackberry Little Lake, Barataria Bay	closed					3
Deep Lake, Lake Chien, Lake Felicity and Lake Tambour	closed					5
Lake Mechant and Bay Junop	closed					
Sister Lake	18-Nov	18-Nov	*1-day Seed harvest*	1	1,250 bbl	
	19-Nov	25-Nov	Market Oyster Harvest	7	10,314 sacks	
Vermilion Bay	closed					6
Calcasieu Lake	1-Nov	20-Jan	East Cove: Market Oyster Harvest	80	3,861 sacks	7
	1-Nov	30-Apr	West Cove: Market Oyster Harvest	210	4,985 sacks	

Activities Related to Fisheries Independent Sampling

Stock Assessments

LDWF completed stock assessments of black drum, sheepshead, southern flounder, and striped mullet that were presented to the LFWC for transmittal to the Louisiana Legislature in February 2020. These assessments use a statistical catch-at-age model to estimate annual time-series of spawning stock biomass and fishing mortality rates. Time-series of fishery catches-at-age along with relative abundance indices developed from LDWF fishery independent surveys are the primary model inputs. Based on results of these assessments, the black drum, sheepshead, and striped mullet stocks are currently not overfished or undergoing overfishing. The southern flounder stock, however, is currently considered overfished. Management options to improve the status of the southern flounder stock will be presented to the LWFC in 2020.

Fisheries Research Lab

LDWF's Fisheries Research Lab in Grand Isle is the base for the state's offshore fisheries independent monitoring and research projects. The lab also serves as a point of contact for the public, visiting researchers, and educational programs. Some current activities at the lab are summarized below:

Southeast Area Monitoring and Assessment Program (SEAMAP)

LDWF typically participates in three SEAMAP surveys: Shrimp/Groundfish, Vertical Line, and Bottom Longline during the January through June time period. Due to the Covid-19 pandemic, the Shrimp/Groundfish survey was cancelled. Vertical Line and Bottom Longline were conducted but at a very reduced rate. On these surveys, teams of three to nine fisheries biologists collect, process, and enter both catch data and environmental parameters, including a water column

profile. These surveys are conducted from April through October with data management and reporting completed during the winter. During the reporting period, sampling and reporting were completed for all surveys conducted. LDWF representatives participated in the Spring GSMFC meeting.

Spotted Sea Trout Life History Study

In 2018, biologists from LDWF's coastal study areas (CSAs) obtained spotted seatrout ovaries and otoliths from dockside sampling (n=1,216). During the reporting period, these samples were aged and histologically staged, and batch fecundity (n=18) was taken where applicable. Spawning fraction and frequency was smaller and more variable than expected, which may be due to lack of larger individuals collected. Spawning frequency was calculated from the 147-day spawning duration multiplied by the spawning fraction equations. Batch fecundity was then multiplied by spawning frequency to achieve annual fecundity. Fecundity data was added from a previous pilot study on spotted seatrout in 2015 (n=11) and from previous work in 1994-1995 (n=25). Both of these datasets were generated from spotted seatrout collected in Barataria Bay. Annual fecundity within length was $1.076(\text{Total Length})^{2.692}$ while annual fecundity at age was $34{,}007{,}142(1\text{-}e^{(-0.451*\text{Age})})^{2.307}$. However, annual fecundity was directly proportional (linear) to body weight, which suggests that spawning stock biomass is an appropriate substitute for total egg production in stock assessment. Future collections will be useful in monitoring increases or decreases in egg production, which may be an indicator of stock health. Female seatrout that are age 2 or 405mm (16inches) total length, on average, produce over 10 million eggs annually. Age 2 fish were most frequently landed before the stock was considered overfished or undergoing overfishing. Therefore, it is recommended that managers take those details into consideration for fishing regulations.

Black Drum Life History Study

November 2019 through March 2020, LDWF biologists sampled 210 black drum ovaries. All 210 ovary samples have been histologically processed and analyzed, but the project was cut short by the pandemic and not enough data was collected to estimate spawning fraction and frequency. None of the 210 ovary samples yielded fecundity estimates. When combined with future samples, this data will determine if spawning stock biomass is an appropriate proxy for total egg production and will further inform managers for establishing regulations.

Sheepshead Life History Study

In February and March 2020, LDWF biologists sampled 84 sheepshead ovaries. All 84 have been histologically processed and analyzed. However, the project was cut short due to the pandemic and not enough data was collected to estimate spawning fraction and frequency. There were four fecundity estimates that came from the 84 ovarian samples. When coupled with future samples, this data will determine if spawning stock biomass is an appropriate proxy for total egg production and will further inform managers for establishing regulations.

Offshore Red Drum Age Structure

The lack of a consistent biological sampling source for offshore red drum has hindered stock assessments, but the LDWF portion of the SEAMAP bottom longline survey could provide a fisheries independent source of otolith and gonad samples. Otoliths would provide abundance of age or year classes within the population while gonad samples would deliver spawning frequency and fecundity estimates. The abundance indices from standardized sampling coupled with age and reproductive analysis from the otolith and gonad samples would more accurately assess the adult population of red drum off Louisiana.

During the 2018, 2019, and 2020 SEAMAP bottom longline survey, LDWF collected otoliths from 160, 269, and 30 red drum, respectively. The low sample size in 2020 was due to the pandemic precautions taken and sampling trips eliminated. Though the majority of those landings occurred outside of the spawning season during spring sampling, 64 gonads were collected from female red drum closer to the spawning season during summer and fall bottom longline sampling. Ages for red drum collected offshore ranged from 4 to 39 years. These data will likely be critical in characterizing the offshore spawning stock of red drum off the Louisiana coast in future stock assessments.

Artificial Reef Monitoring for Sportfish

In order to enhance the monitoring of sportfish species on artificial reef structures, LDWF biologists from the Grand Isle Fisheries Research Lab are using a combination of vertical line sampling, video sampling, and diver surveys. Approximately ten percent of the artificial reef structures in the LDWF Offshore Artificial Reef Program were randomly selected and assigned to the 2020 vertical line survey. Due to COVID-19 restrictions, vertical line sampling did not occur within the reporting period. Data entered prior to the 2018 sampling season (2015-2017, n = 104 stations) was verified during the reporting period, and the database was updated as needed.

Additionally, LDWF included a roving diver survey component into the LDWF artificial reef monitoring effort. While LDWF has previously conducted dive surveys at standing platforms, no dive surveys had been conducted at artificial reef sites prior to 2018. Biologists surveyed finfish species at the artificial reef site and the nearest standing platform. During the reporting period, all dive survey videos were reviewed. Survey start and finish times assigned as well as ascent and descent times. MIN counts were then performed in 10 second intervals using the read protocols used for the vertical line video reads. MIN counts were performed on species covered in the GMFMC Reef Fish Fishery Management Plan (Gray triggerfish, Almaco jack, Greater amberjack, Gray snapper, Lane snapper, Red snapper, Vermilion snapper and Groupers) as well as Coastal Migratory Pelagics FMP (Cobia and Spanish mackerel). 241 reads were made over the survey times of the video's as well as the decent and ascent reads. An excel sheet was created and all read data entered and reviewed.

Shrimp Sampling

LDWF conducts fisheries independent sampling for shrimp year-round statewide using three trawl sizes: 6-foot, 16-foot, and 20-foot. The 6-foot trawl samples gather data in the interior marshes of Louisiana and are used to set the opening and closing dates for the spring inshore shrimp season. These samples are typically taken throughout April and again at the end of June and beginning of July, depending on environmental conditions. From January – June 2020, a total of 299 6-foot trawl samples were conducted. Samples conducted throughout April and early May were used to set the Louisiana spring inshore shrimp season, as described earlier. Brown shrimp CPUE during April and early May 6-foot trawl samples was lower than the previous years.

The 16-foot trawl sampling data are used to constantly monitor the state shrimp resource, along with other species of interest, and set the opening date for the fall inshore shrimp season. During January – June 2020, a total of 905 16-foot trawl samples were conducted. These data were used to open state inshore waters for the 2020 fall inshore shrimp season, as well as, monitor statewide resources monthly.

The 20-foot trawl sampling data are used to monitor shrimp resources in state offshore waters. A total of 189 20-foot trawl samples were conducted during January – June 2020. Data collected in the 20-foot trawl samples were used to open the portions of state offshore waters described earlier.

Crab Sampling

Fisheries independent sampling data for blue crab is collected with 16-foot trawls. These data are used to calculate juvenile and adult blue crab indices of abundance for the blue crab stock assessment.

Oyster Sampling

LDWF conducts fisheries independent sampling for oysters year-round statewide using two gear types (24-inch hand dredge and square-meter frame: m2) within the public oyster areas, and analyze the data collected to determine overall health of the oyster resource throughout the year. Dredge sampling events were conducted monthly (except in the month of July) on 74 sampling stations and quarterly on six (Sabine Lake only) sampling stations, with two replicates per station, to monitor size frequency, presence and/or absence, and mortality. A total of 897 dredge samples were collected between January 1 and June 30, 2020.

For annual stock assessments, LDWF biologists collect field samples in July from each CSA across Louisiana to perform a quantitative evaluation of the oyster stock on the state's public oyster areas. Biologists SCUBA dive on designated sampling stations within each CSA. At each sampling station, an aluminum square-meter frame (quadrat/m2) is randomly placed on the oyster reef, and all live and dead oysters, reef- associated organisms, and exposed reef material are collected by hand from the upper portion of the substrate within the quadrat. This process is replicated five times at each sampling station. Water temperature, dissolved oxygen, and

salinity data are collected in conjunction with the m2 samples, and cultch material types are identified and weighed.

Sabine Lake is closed for commercial oyster harvest since Legislative Act 159 (2018) that instituted a moratorium on oyster fishing in Sabine Lake. Therefore, dredge samples are conducted quarterly, and square-meter sampling are only being conducted every other year, with the next sampling scheduled for July 2021. Additional sampling may occur as needed to monitor for possible mortality events associated with significant freshwater input events.

Additional square-meter sampling was conducted in the Lake Pontchartrain and Barataria basins in May 2020 as part of an agreement with the Coastal Protection and Restoration Authority (CPRA). In the Barataria Basin, additional sampling was also conducted on private lease areas per the CPRA agreement to further characterize oyster resources in that basin.

Sampling conducted as part of the annual oyster stock assessment plays a valuable role in predicting the success of the upcoming oyster season, which generally opens in early September and runs through April of the following year. However, the season may be closed or delayed if biological concerns or enforcement problems are encountered. LDWF uses oyster stock assessment information to make recommendations regarding setting the oyster season to the Louisiana Wildlife and Fisheries Commission.

Finfish Sampling

LDWF conducts biological monitoring for finfish statewide in the coastal, nearshore, and offshore areas of Louisiana. During fiscal year 2019-20, the fisheries independent finfish sampling program collected 953 gillnet samples, 1,271 seine samples, and 271 trammel net samples for a 99.3 percent overall completion rate statewide. Electro-fishing samples (159 total) are being conducted within some Louisiana estuarine environments to provide fisheries data to CPRA.

Other State Activities

Finfish Seasons and Regulations

Louisiana waters closed to the harvest of sharks in the aggregated large coastal group (nurse, bull, lemon, sandbar, silky, spinner, and tiger) and hammerhead group (smooth, scalloped, and great) on March 14, 2020.

Louisiana waters closed to the recreational harvest of gray triggerfish on May 2, 2020.

On May 20, 2020 a final rule published that modified the existing recreational red snapper season framework to set the season to open each year on the Friday before Memorial Day as a weekends only season including the Mondays of Memorial Day and Labor Day as well as the 4th

of July regardless of what day it falls upon. The final rule also clarified language relating to the state delegation of the recreational red snapper season.

Louisiana and federal waters off of Louisiana opened to the recreational harvest of red snapper on May 22, 2020 on weekends only (Friday, Saturday, and Sunday) including the Mondays of Memorial Day and Labor Day.

At its regular meeting on May 7, 2020 the Louisiana Wildlife and Fisheries Commission (LWFC) ratified a Notice of Intent (NOI) to modify the recreational and commercial minimum size limit for Cobia to 36 inches fork length. Public comments on the NOI were taken until Thursday, July 2, 2020.

At its regular meeting on June 4, 2020 the LWFC promulgated a NOI to modify the commercial trip limits for greater amberjack from 1,500 pounds gutted weight to 1,000 pounds gutted weight and allow for Secretarial authority to modify commercial reef fish trip limits if notified by NOAA Fisheries of in-season changes.

Louisiana and federal waters off of Louisiana closed to the recreational harvest of red snapper on August 13, 2020.

Louisiana and federal waters off of Louisiana reopened to the recreational harvest of red snapper for the Labor Day weekend on September 4, 2020 and closed on September 7, 2020.

Louisiana waters reopened to the recreational harvest of gray triggerfish from September 1, 2020 through October 26, 2020.

Marine Mammal and Sea Turtle Monitoring

The marine mammal stranding program and the sea turtle stranding program are administered and coordinated directly by NOAA in Louisiana.

Michael C. Voisin Oyster Hatchery

The Michael C. Voisin Oyster Hatchery located on Grand Isle, Louisiana, is operated through a collaborative effort between LDWF and Louisiana Sea Grant (LSG). LSG assists with facility operations, provides technical guidance, manages the LSG Breeding Program, and supports the oyster industry through extension, outreach, and research projects. LDWF focuses on the production of diploid and triploid seed and larvae for state restoration projects, as well as commercial sales to support the industry.

Spring 2020 hatchery production focused on producing diploid pediveligers and seed for LDWF sales. A total of approximately 42 million diploid pediveliger larvae were produced, of this approximately 14 million were sold to farmers. Approximately 397,391 diploid seed were sold to farmers prior to June 30th. Additional seed remained in the nursery system pending sale.

Extra diploid pediveligers (PV), those which farmers could not accept at the time, were either set on microcultch to produce seed for sales (16 million PVs) or set on macrocultch for restoration (11 million PVs). Of the 11 million PVs set on macrocultch, there were approximately 1.25 million spat that set and were deployed at LDWF's West Karako Bay Artificial/Broodstock Reef site.

The hatchery started algae production in January. Marine microalgae is grown in a Stock Room and Algal Production Room to feed oyster larvae. Staff tested the survival of algae grown in flasks treated with combinations of EDTA and different media volumes, to test if current growing procedures provided optimal growth and survival for algae cultures. The flask trials were based on a trial done in fall 2019 where hatchery seawater was treated with EDTA and survival of algae grown in bags was observed. Results for the bag trial showed that the addition of EDTA in seawater resulted in poor algal survival. Final results for the flask trial are pending, however, initial observations did not show obvious differences between treatments. Algae production continued in the Stock Room and Algal Production Room throughout the spring and summer using Standard Operating Procedures.

Spat on Shell Projects

The Louisiana Department of Wildlife and Fisheries Michael C. Voisin Oyster Hatchery produces diploid oyster larvae for setting on shell, which is then referred to as spat-on-shell and is used for State oyster restoration projects. To prepare for setting on shell, mesh bags that are three feet long are filled with recycled oyster shell and are called shellbags. Recycled shell is obtained through a collaboration with the Coalition to Restore Coastal Louisiana's Oyster Shell Recycling Program.

In February and March 2020, the Oyster Hatchery coordinated multiple shellbagging events at the Grand Isle Fisheries Research Lab (FRL) with assistance from LDWF, Louisiana Sea Grant and LDWF Aquatic Volunteer Instructors. Approximately 110 cubic yards of shell were bagged, generating almost 4,170 shellbags, which is enough shell for setting at least 64 million diploid pediveligers.

In early spring, four setting tanks capable of holding approximately 115-130 shellbags each, located underneath the FRL, were prepared for spat-on-shell production. Spat-on-shell production and deployments were delayed during the spring of 2020 due to COVID-19. During June 2020, the Oyster Hatchery set 11,350,000 pediveligers on macrocultch that were deployed by LDWF staff within the public oyster seed grounds of Karako Bay.

After 6 months of monitoring, the 2019 Barataria POSG spat on shell deployment sites were discontinued in December 2019 because no live oysters were observed. No live oysters were observed during May 2020 after monitoring the 2019 Breton Sound POSG sites for 12 months.

Oyster Transplant Projects

Oyster impacts from the increased freshwater flows in the spring and summer of 2019 were investigated via standard and enhanced fisheries independent sampling (dredge) on public oyster areas. The highest freshwater output was concentrated in Coastal Study Area (CSA) 1-North. CSA-1 North is the outfall area for the Bonnet Carré Spillway as well as the Pearl River. This flooding event dramatically reduced salinities in the receiving basins and increased oyster mortalities were documented in subsequent biological sampling.

In an effort to facilitate natural recovery from the 2019 flooding event, LDWF collected oysters from reefs in the least impacted basins of the State and transplanted to previously productive reefs in Pontchartrain Basin. Adult reproductive oysters were collected in Sister Lake and in Calcasieu Lake during each routine dredge events in October 2019, November 2019, and January 2020 and transplanted to Round Island, Shell Island, and Lake Fortuna sites, respectively. The objective of the project was for these transplanted animals to spawn and reseed reefs as the salinities in the area return to a suitable range for oyster production.

With each transplant, a sub sample of 20 oysters were set in a containment device (modified crab trap) with a spat plate attached to it for monthly monitoring. As of June 2020, only one containment device remained at the Shell Point site to be monitored. It contained 92 live spat found attached to the spat plate. All other containment devices were lost and not replaced over the course of the monthly monitoring.

Boating and Non-Boating Access Projects

LDWF has several new and ongoing boating and fishing access projects, which are funded through the Sport Fish Restoration Program and administered by local entities. LDWF accepts project proposals on an annual basis and evaluates them based on ranking criteria and available funding. Current projects include:

- Port Sulphur Civic Drive Fishing Pier – construction contract has been awarded
- St. Tammany Fishing Pier – review of construction contract
- West End – Breakwater Drive Boat Launch – construction complete
- New Iberia Boat Slips Boating Infrastructure Grant Program – advertised for bid
- City of New Iberia CVA Sanitation Facility – design phase
- Indian Creek Recreation Area Fishing Pier – bid awarded
- City of New Iberia Civic Center Marina Phase I – design phase
- Marina Del Ray Renovations – permitting phase
- City of New Iberia Civic Center Marina Phase II – permitting phase
- Town of Leonville Boat Launch Improvements – design phase
- Town of Madisonville Boat Launch Improvements – advertised for bid

Additional boating and fishing access projects were recently approved by the Louisiana Trustee Implementation Group for funding from the *Deepwater Horizon* oil spill and are currently being designed and implemented.

Seafood Industry Professionalism

LDWF seeks to give the state's seafood industry access and training to the latest trends, requirements, and technology in their profession, as expert training will yield higher quality products and give the seafood community a competitive advantage in the marketplace. Since the launch of Louisiana Fisheries Forward: Advancing Our Seafood Industry, this one-of-a-kind professionalism program for Louisiana's commercial fishing industry has received inquiry, acknowledgement, and recognition throughout many facets of local, regional, national and world fishing industries.

The Louisiana Fisheries Forward contract was renewed for one year beginning January 2020. During the first half of the year an oyster remote setting whiteboard video was created along with a corresponding fact sheet. Additionally, fact sheets were developed on the impact of shrimp imports in Louisiana, HACCP training and sanitation control for processors.

In addition, a report characterizing the recreational for hire sector in Louisiana was completed as well as a report on the status and trends in Louisiana's commercial freshwater fisheries. The results of these reports were presented at the 2020 Louisiana Fisheries Forward summit which was held in early March 2020. Louisiana was in the beginning stages of Covid-19 at this time which likely accounted for the lower than normal attendance figures. In response to Covid-19, the Louisiana Fisheries Forward team quickly developed informational materials on safety guidelines for commercial fishermen as well as seafood processors.

Aquatic Plant Control

Invasive aquatic vegetation continues to threaten access and recreational activities throughout Louisiana. Spring surveys conducted from March - May 2020 revealed an estimated 257,746 acres of nuisance aquatic plant coverage, mostly composed of water hyacinth (74,160 acres) and giant salvinia (53,660 acres). Spring surveys are conducted at the beginning of the growing season and usually reflect slightly less coverage than fall surveys conducted at the end of the growing season. From January 1, 2020 through June 30, 2020, LDWF applied EPA-approved herbicides to 21,699.32 acres of nuisance vegetation across the state. The majority of plant control efforts focused on giant salvinia and water hyacinth, with 10,497.91 and 8,482.63 acres treated, respectively. A major area of focus was Black and Clear Lakes in Natchitoches Parish, both of which suffer from a chronic giant salvinia infestation. A total of 3,255.8 acres of giant salvinia were treated on Black and Clear Lakes. LDWF treated approximately 2,160 acres of water hyacinth on Bayou Penchant.

Winter temperatures and isolated flood events have the potential to be major factors in determining the severity of aquatic vegetation impacts, especially giant salvinia, in Louisiana. Occurrences of below freezing temperatures, for the duration of several hours, provide

excellent control of aquatic vegetation. The lack of below freezing temperatures experienced last winter has led to higher than usual spring aquatic vegetation coverage. Drawdowns are currently being conducted on several waterbodies throughout Louisiana. Vegetation assessments will be made in the fall, and herbicide applications will be made accordingly.

Gulf States Marine Fisheries Commission
71st Annual Fall Meeting
Technical Coordinating Committee
Wednesday, 14 October 2020
Virtual Meeting

1. Emerging Issues Pertinent to Gulf of Mexico Fisheries.

PROPOSED REGULATORY CHANGES

Statewide Recreational and Commercial Fishing

Proposed changes to flounder regulations

To manage a declining flounder fishery, two proposals were submitted to the TPW Commission that would decrease fishing effort during the fall spawning run, as well as protect smaller spawning capable females. We estimate this will increase spawning biomass by 58%. These proposed regulations were:

- Closing November 1 to December 14 to all flounder fishing (currently no gigging in Nov and reduced catch of 2 fish/person for that period compared to 5 during rest of year).
- Increase the minimum size limit to 15-inches (currently 14-inch min size limit).

These proposals were adopted by the commission; however, due to COVID issues, the Nov-Dec closure was pushed back to take effect September 2021. The 15" minimum size limit took effect on September 1, 2020.

Oyster Updates

Oyster Mariculture Update

The Texas commercial oyster fishery has primarily relied upon the harvest of oysters from natural reefs in areas approved by the Texas Department of State Health Services and under certificates of location, or lease programs, in Galveston Bay. However, as the value of oysters continues to increase, interest in off-bottom cage culture of oysters has gained popularity throughout the United States and Texas. During the 86th Texas Legislative Session, HB 1300 granted authority to the Parks and Wildlife Commission to develop an off-bottom oyster mariculture program using enclosed cages. In May 2020, the Parks and Wildlife Commission adopted rules establishing this program. We have created a website that can now be accessed by any persons interested in beginning the process of applying for a permit and designating a location for their lease.
https://tpwd.texas.gov/fishboat/fish/commercial/com_cf/com_index.phtml

We are working closely with prospective applicants to provide them with information of areas available for lease in Texas bays.

Oyster Shell Recovery

HB51 (85th Legislative Session, 2017) included a requirement that dealers purchasing oysters harvested from Texas bay systems return 30%, by volume, of the total quantity of oysters harvested during the previous license year. In lieu of returning this cultch back to public oyster reefs, dealers can pay the department a sack fee that will allow the department to return an equivalent amount to public reefs. The current amount of this fee per sack is $1.32. So far, in 2019-20 landings reported to the Texas Commercial Landings Program (LY20 Sep-Jul), 868,743 sacks (110 lbs/sack) of oysters were landed from TX bays. That total amounts to 15,082 cubic yards of cultch or $1,146,740 due from oyster dealers. In LY 2019, dealers worked with TPWD to place 9,705 cubic yards of cultch back into TX bays, while remaining dealers paid $205,972 into the Shell Recovery Fund (for future planting) (Table 1). Some dealers have had issues putting out cultch or paying in LY2020 due to COVID, so we are working with them as much as possible to accommodate their issues.

Table 1. Summary of Oyster Shell Recovery program (LY2018-2020)

				Final Disposition	
LY (Sep-Aug)	**Sacks Harvested**	**Cultch Due (cu yds)**	**Fee in lieu of cultch**	**Cultch**	**Fee**
2018	564,787	9,805.3	$745,518	6,590.6	$241,815
2019	754,565	13,100.0	$996,025	9,705.3	$205,972
*2020	868,743	15,082.2	$1,146,740	3,220.0	$229,258

*As of 9/8/2020 (through July landings)

- Approximately 9,000 cu yds of cultch was placed in Aransas Bay this summer at Grass Island. This was mostly funded by Hurricane Harvey Emergency grants, but partially by shell recovery fees. An additional 4,000 cu yds is scheduled to be placed in Sabine Lake.
- CCA purchased two sets of oyster patent tongs for the Galveston and Aransas Bay field labs. We plan on assessing their utility in monitoring our oysters in the near future.

Texas Oyster Landings

Oyster landings in LY2020 were greater than landings in any of the previous five years (figure 1). There was some apparent reduction of catch at the end of the 2020 season most likely due to COVID. In previous years, there were also reductions of catch later in the season for various reasons (area closures and possibly reductions of available stock). In LY2019, there were several areas closed to harvest in December due to rainfall/runoff, which resulted in a decrease in trips made in December, possibly explaining some reduction in harvest. The 2015-16 season started off with closures due to red tide, and harvest levels never recovered to average levels as compared to more recent years (figure 1).

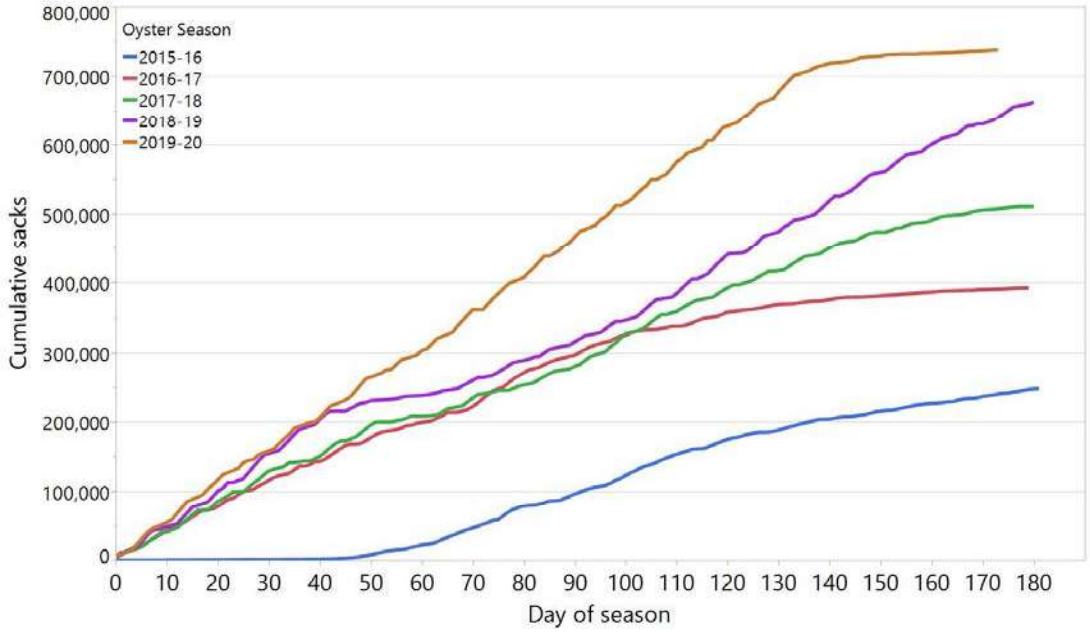


Figure 1. Cumulative number of sacks collected by the Texas oyster fishery during the last 5 years of the public season (Nov-Apr).

2. Activities Related to Artificial Reef Programs.

All travel and non-essential meetings and field work has been placed on hold due to COVID-19.

Rigs-to-Reefs

The Reef Program did not receive any donations to the program.

Date	Rig	Removal type	Donation	Jacket
NA – No Donations				

- The USACOE reef permit for Fieldwood Energy's HI-A-520 was received. Fieldwood Energy has been the main donor for Texas Rigs-to-Reefs and in a recent call stated it is unlikely that they will be doing any reefing in Texas this year due to the COVID-19 slowdowns of work and the slow process of getting platforms decommissioned by the Bureau of Safety and Environmental Enforcement (BSEE).
- The deployment of three (3) deep-water spars[1] currently owned by Anadarko Oil and Gas is currently being considered for inclusion in the Rigs-to-Reefs program. An 80-acre location for these spars and future deployments has been identified in 450 ft water and Anadarko has completed a basic ROV survey to determine if this area is free of bottom hazards.
- The USACOE reef permit for HI-A-520 was received in APR. Fieldwood Energy has not moved forward with reefing of the 8-pile structure due to economic conditions.

[1] large cylinders that offshore platforms float on top of; about 450ft long x 100 in diameter

- Initial discussions about a new Rigs-to-Reefs project, HI-A-557A platform, began with Talus Petroleum (via Athena Consulting).

Ships-to-Reefs / Nearshore Reefs

- Friends of Rio Grande Valley Reef are proposing to reef clusters of railway ties around the Texas Clipper at no cost to TPWD. This would provide additional low-profile material to the site for enhancing the prey base for larger fishes such as red snapper. TPWD ARP will be renewing the reef permit for the work and UT-RGV will be following up with scientific studies/observations.
- The deployment of a steel-hulled sailboat has been coordinated with a Freeport public member who wants to donate the vessel to the nearshore program through the Public Reefing Program. It is being cleaned and readied for reefing at Kate's reef, off Galveston. A Houston public member will partially fund the efforts. The vessel has been inspected and will be deployed in September 2020. All work will be completed without any funding from TPWD. TPWD will assume liability for the vessel once it is properly reefed according to the agreement between TPWD and the public member.
- Two steel-hulled vessels are being cleaned and readied for reefing by the Friends of RGV Reef. They will be reefed within the Rio Grande Valley Nearshore Reef (PS-1105).

Nearshore Reefs

- Reefing has been completed for the MU-775 (Corpus Christi Nearshore Reef), using Hurricane Harvey Relief Funds. The work was completed by The Friends of Rio Grande Valley Reef (a 501-c3 group). The contract called for reefing 1,000 tons of concrete railway ties in 8 piles, but the group reached beyond that and added 1500 tons of material to the reef in 12 piles, keeping the contract under our $750,000 budget. In addition, they added 800 additional tons to the reef under funding from CCA. So, in total, they added 2300 total tons of concrete to the reef for enhancing juvenile marine fish habitat.
    - Dr. Rick Kline (UT-RGV) conducted a sidescan survey of the railway tie deployment at MU-775 above for the final survey report. This completed one of three Hurricane Harvey Relief Fund projects.
- The Program is working with Saltwater Fisheries Enhancement Association (SEA) and the City of Corpus Christi to secure a 2-acre tract of property at the Port of Corpus Christi to store future reef materials. The US181 Harbor Bridge will be dismantled soon, and we hope to gain some of that material for offshore reef building.
- The Request for Proposals for 3 reefing projects was placed on bid by TPWD Contracting and closed 4 August. Funding is through the Hurricane Harvey Relief Funds (Kate's and Big Man's Reefs off Galveston) and CCA. Plans call for concrete pyramids and low-relief materials. Bid evaluations are currently ongoing. All work must be completed by 31 August 2021.
- A deployment of memorial balls has been coordinated between Eternal Reefs and TPWD ARP. The deployment is scheduled for September.
- A Memorandum of Agreement was drafted between TPWD and UT-RGV for conducting a side-scan survey of the entire PS-1105 Rio Grande Valley Nearshore Reef. Dr. Rick Kline will work with graduate students to complete the survey and provide hydrographic training to students. Training will also include the use of underwater scooters and the program's Outlander ROV.

Grants / Administration

- The GLO Coastal Coordination Advisory Committee and the Texas Coastal Management Program notified the ARP of a successful grant PRE-proposal for the construction and enhancement of artificial reefs in the Northern Gulf of Mexico. If the full proposal is accepted, the grant would create and deploy 100 pyramids and 100 low-relief reef plates.
- The GLO Asset Removal team and the ARP have been in communication to discuss the planned removal of the old Queen Isabella Causeway off Port Isabel/South Padre Island. The Coastal Management Program accepted the proposal and Phase 1 of the process has been approved. The next steps include an engineering study and deployment/reefing plan ($170,000) to provide measurements and technical specifications of what remains of the Port Isabel side (~3500 linear ft). The GLO has ownership of the bridge and it must be removed at some point soon. Estimates show that it may require $10-12m for removal (and reefing). Once the engineering study is complete, next steps would involve coordinating with the GLO for the complete removal of the old causeway and the deployment of it as reef material. Due to the high cost of the removal and deployment of the old causeway, Gulf of Mexico Energy Security Act (GoMESA) funds would be involved.

Resource Sampling / Harvest Monitoring Updates / Science

- The ARP has been working with Katie O'Shaughnessy (Science Policy Fellow - National Academy of Sciences; assigned to CF) to complete a summary report for the biological monitoring from 1990 – 2019. The report will be published as an internal TPWD Management Data Series. The draft manuscript has been submitted for internal review and editorial comments.

Equipment / Construction / Housekeeping Matters

- TPWD Contracting extended the ARP's current buoy maintenance contracts for 6 additional months to allow time for staff to draft a new Invitation for Bid (IFB). The upcoming FY end, rollover into CAPPS, and COVID-19 has slowed contracting progress. These buoy maintenance contracts are re-bid every 2-4 years.

Meetings / Outreach / Education Events

- The 2020 Florida Artificial Reef Summit (Melbourne, FL), originally scheduled for April, was delayed to November due to COVID-19. It was then converted to a virtual event, again due to COVID-19. The ARP intends to create a poster to share the preliminary results from the ARP and USGS biological, chemical, and physical monitoring. The ARP has had an ongoing interagency contract with the USGS since 2013 to study 4-5 reef sites in the High Island (HI) shelf area about 70 miles off Galveston.

- The ARP continues to participate in a Flower Garden Banks National Marine Sanctuary Special Advisory Committee as a non-voting representative. The last three meetings have moved from in-person to virtual.

3. Activities Associated with the Gulf of Mexico Crab Fisheries.

Abandoned Crab Trap Removal Program

The Texas Parks and Wildlife Department (TPWD) closed state waters to crabbing (with crab traps) from February 21 – March 1, 2020. During this time, crab traps encountered are classified as "abandoned" and may be removed by Law Enforcement personnel, Department staff, and any member of the general public. A grand total of 2,029 traps were removed. We documented 327 volunteers participating onboard 95 boats during the annual closure. Table 1. has the data broken down by major bay.

Table 1. Abandoned Crab Trap Removal Program Summary

ACTRP 2020 Results	Traps	Volunteers	Boats
Sabine Lake	5	0	1
Galveston Bay	366	162	24
Matagorda Bay	140	23	15
San Antonio Bay	1,249	107	41
Aransas Bay	243	34	12
Corpus Christi Bay	21	0	0
Upper Laguna Madre	2	0	0
Lower Laguna Madre	3	1	2
Totals	**2,029**	**327**	**95**

Blue Crab Updates

Coastwide declines in fishery independent surveys (bag seine and bay trawl) continued through 2019 (Figures 1-2). This trend was generally consistent in all Texas bay systems but was especially pronounced in central Texas coast bays and especially in bay trawl sampling gear. These declining fishery independent trends largely began in the mid-1990's. While declining trends into the early 2000's have slowed, relative abundance remains at low levels. Recent analyses of blue crab mortality using a length-based mortality estimator (Hoenig 1987) indicate that juvenile mortality (~15-40 mm) may be the factor inhibiting the recovery of the population. Correlations of juvenile mortality with abundance of common finfish predators may indicate predation as the primary cause here (Figure 3). Mortality (Z) of juveniles is related to abundance of cancrivorous finfish.

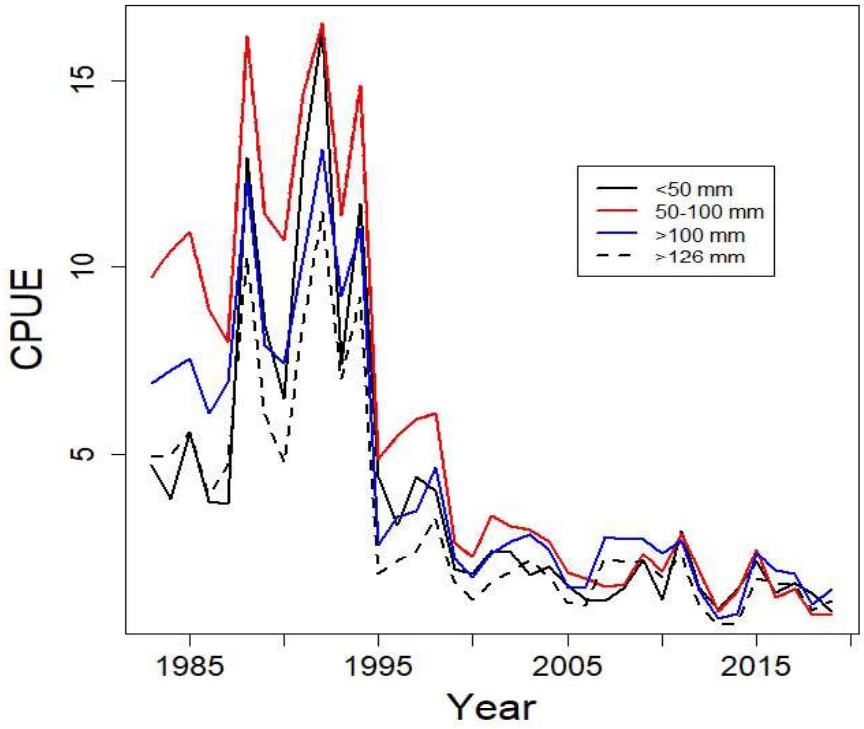


Figure 1. Fishery independent bay trawl catch rates of blue crabs in Texas.

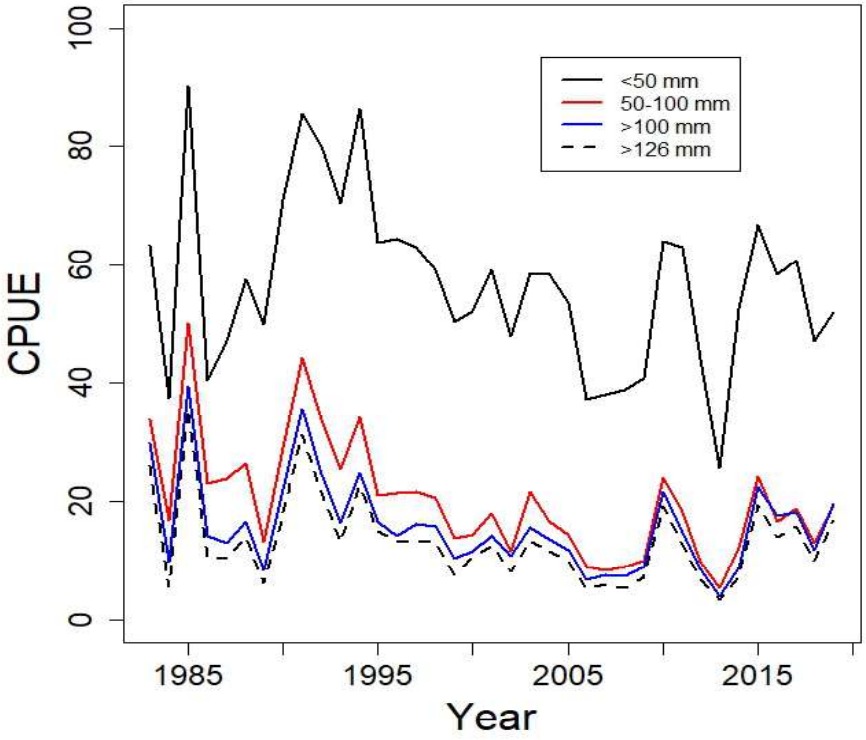


Figure 2. Fishery independent bag seine catch rates of blue crabs in Texas.

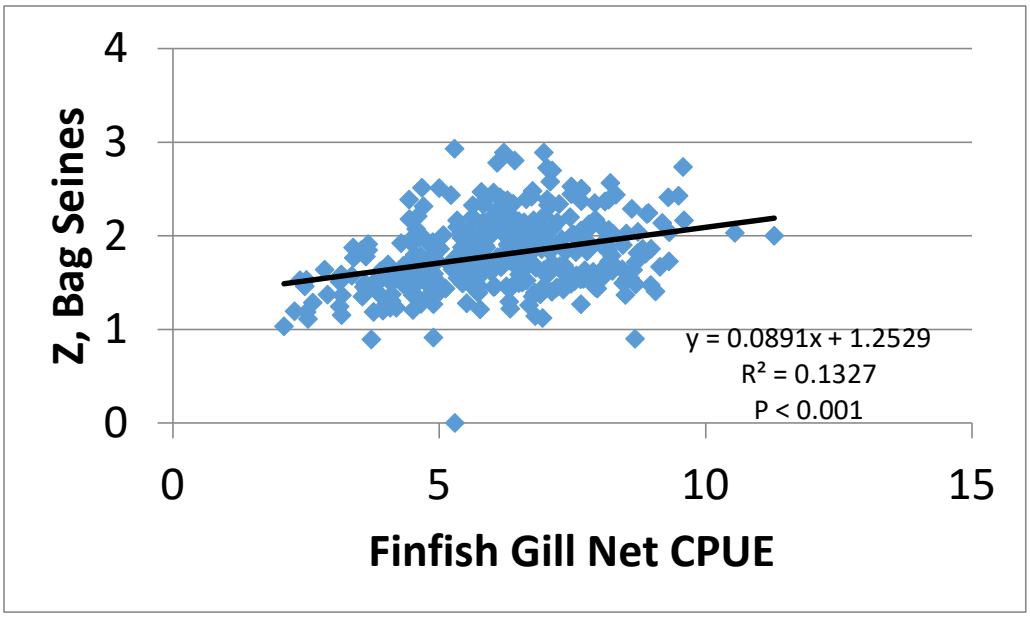


Figure 3. Blue crab mortality (Z) estimates vs. finfish abundance.

Commercial Landings

When adjusted for effort, landings of blue crab in Texas have been fairly consistent over the last five years (2015-2019, see Figure 4). However, in 2019 total landings of blue crab in Texas were 3,912,577 lbs which is about 31% lower than the 37-year annual average of 5,672,167 lbs (Figure 5). With reduced landings and high demand, value has shown an increasing trend since 2014. The value of total landings in Texas in 2019 was $5,529,154 which is about 55% higher than the 37-year average of $3,560,901 (Figure 5).

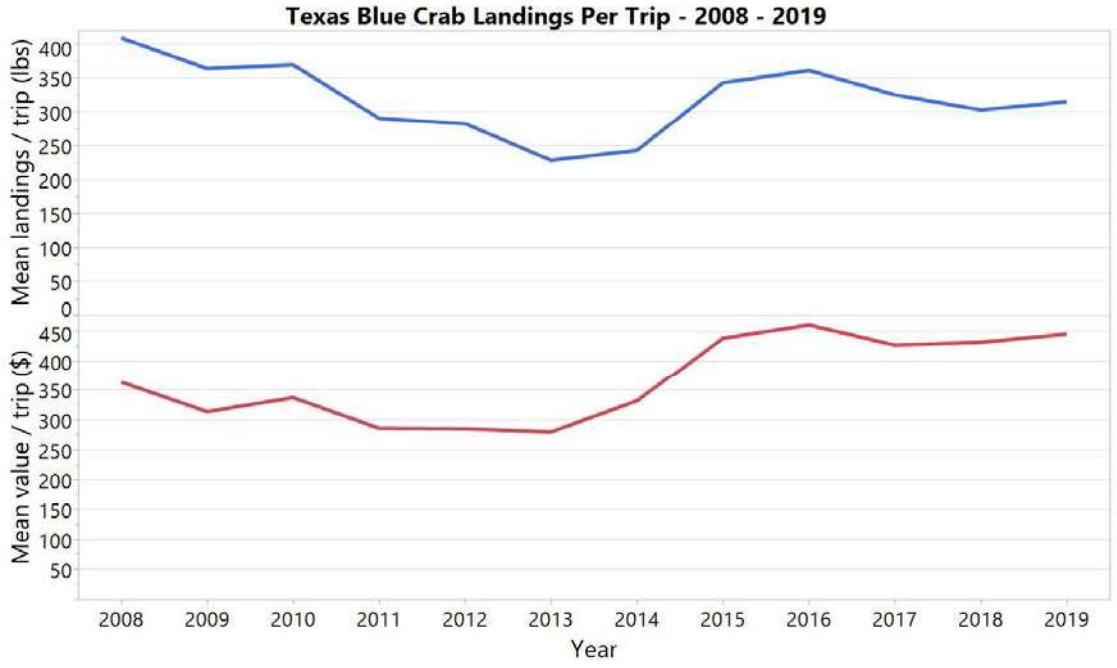


Figure 4. Mean Landings and value of blue crab per trip.

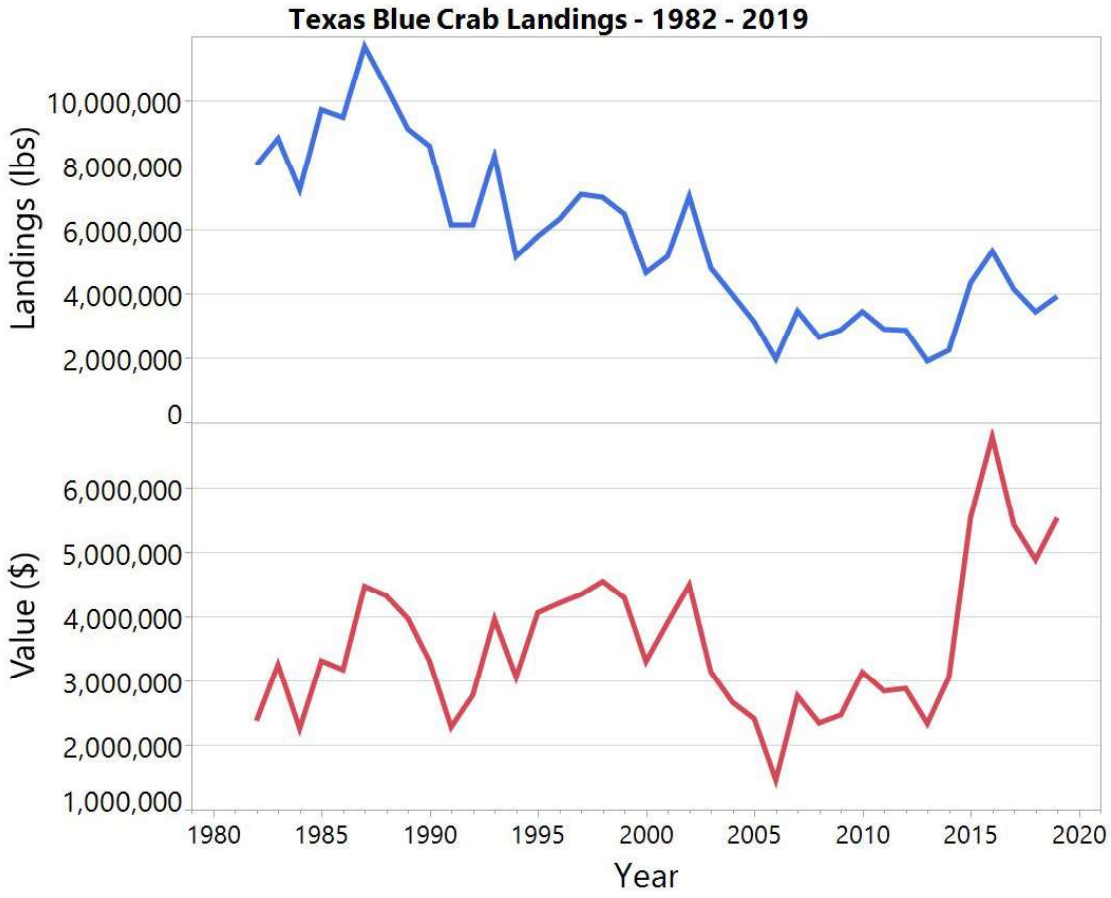


Figure 5. Total annual landings and value of blue crab in Texas.

Regulatory Proposals

There were no changes made to the commercial or recreational fishing regulations concerning blue crabs during FY 2020. The following regulation is being considered for modification in FY 2022:

The use of crab traps along a small section of shoreline in Aransas Bay, Aransas County has been prohibited since the 1980's. *"May not fish a crab trap… in the water area of Aransas Bay within one-half mile of a line from Hail Point on the Lamar Peninsula, then direct to the eastern end of Goose Island, then along the southern shore of Goose Island, then along the eastern shoreline of the Live Oak Peninsula past the town of Fulton, past Nine Mile Point, past the town of Rockport to a point at the east end of Talley Island including that part of Copano Bay within 1,000 feet of the causeway between Lamar Peninsula and Live Oak Peninsula."*

https://tpwd.texas.gov/regulations/outdoor-annual/fishing/general-rules-regulations/legal-devices-for-fish/#crab-traps

This regulation is being considered for modification as: 1) it has no significant biological impact to the crab fishery and 2) it unreasonably impacts property owners in this area.

4. Activities Related to Fisheries Dependent Data Collection.

Fishery-Dependent harvest data collection (creel surveys)

Due to COVID-19, TPWD made temporary changes to their creel sampling protocols. Our "low-use season" creel sampling is conducted from mid-November until mid-May. Creel surveys in April – May 14th were modified to not count/measure fish, and only recorded trips. On May 15th, we returned to full sampling protocols.

Fishery-dependent collection of otoliths for the Gulf States Biosampling program

We are collecting otoliths from multiple species in conjunction with the GSMFC biosampling program. Otoliths are being collected from recreational anglers and aged via independent contractors paid by GSMFC. To date, the following samples have been processed at our facility:

Table 4. Summary of otoliths collected from recreational species at boat ramps for Gulf States Biosampling program.

Common Name	Scientific Name	Processed	Requested
Gray Snapper	*Lutjanus griseus*	20	100
Vermillion Snapper	*Rhomboplites aurorubens*	26	200
Red Snapper	*Lutjanus campechanus*	106	400
Triggerfish	*Balistes capriscus*	0	50
King Mackerel	*Scomberomorus cavalla*	0	300
Sheepshead	*Archosargus probatocephalus*	100	100
Southern Flounder	*Paralichthys lethostigma*	144	200
Black Drum	*Pogonias cromis*	244	400
Red Drum	*Sciaenops ocellatus*	279	800
Spotted Seatrout	*Cynoscion nebulosus*	946	1700

5. Activities Related to Fisheries-Independent Sampling.

SEAMAP

Vertical line (VL)

2020 Vertical longline operations were cancelled due to COVID. Staffing RVs to levels needed to conduct sampling was not possible due to distancing restrictions. We attempted to reach out to several groups to contract the work out but were unsuccessful. Operations are planned to begin again during 2021.

Bottom longline (BLL)

2020 Bottom longline operations were cancelled due to COVID. Staffing RVs to levels needed to conduct sampling was not possible due to distancing restrictions. We were able to acquire a longline winch for the field lab vessel in stat zone 21, so once sampling is able to commence, we can expand sampling into south Texas areas.

6. Other State Activities.

License Buyback Program

Shrimp

Buyback Round 38

- Application period closed January 17, 2020 (Open approximately 60 days)
- 20 applications received
- Currently reviewing bids
- Purchased a total of 7 (4 bay and 3 bait)
- Total purchase price was $64,500
- Avg. purchase price was $9,214

Finfish

Buyback Round 26

- Application period closed January 17, 2020 (Open approximately 60 days)
- 2 applications received
- Currently reviewing bids
- No bids accepted – independent sales as high as $25K

Crab

Buyback Round 23

- Application period closed January 17, 2020 (Open approximately 60 days)
- No applications received

Oyster

Buyback Round 3

- Application period closed January 17, 2020 (Open approximately 60 days)
- 2 applications received
- Currently reviewing bids
- Purchased a total of 1 license
- Total purchase price was $12,000

Fisheries Enhancement Program (Hatcheries)

FY 2020 Water Body	Red Drum Fingerlings stocked	Spotted Seatrout Fingerlings stocked	Southern Flounder Fingerlings stocked
Aransas	2,412,477	54,766	22,377
Corpus Christi	729,711		
East Matagorda	1,993,739	2,329,842	
Galveston	6,786,757	55,635	2,958
Lower Laguna Madre	2,916,008	531,064	
Sabine Lake	1,923,992		
San Antonio	554,991	15,000	
West Matagorda	2,589,604	1,607	
Upper Laguna Madre	2,561,227		

Freshwater			
Calaveras	693,291		
Kleberg Park	2,879		
Lake Bryan	171,933		
Victor Brauning	352,036		
Total	**23,688,645**	**2,987,914**	**25,335**

Perry R. Bass Marine Fisheries Research Station Updates

1. PRB Projects

Sciaenidae otolith collection

All *Sciaenops ocellatus* and *Cynoscion nebulosus* otolith age files have now been compiled into a single database to promote efficient use of the data. Although physical samples go back to 1995, preliminary analysis of spotted seatrout (*Cynoscion nebulosus*) otolith data has resulted in fishes back-aged to the 1990 cohort. Significant trends in growth among years and among Texas estuaries have been observed, and these trends are being used to assess drivers of growth and mortality. Currently, work is ongoing on a publication dealing with spotted seatrout age and body growth over a near 30-year span. Spotted seatrout otolith collections were discontinued due to COVID-19, and these collections are unlikely to resume in the near future. Similarly, we are evaluating whether to continue with red drum collections next year.

Eastern oyster (*Crassostrea virginica*) population genomics

This project consists of sampling oysters throughout the Gulf and using high-throughput "next generation" approaches for generating a high resolution SNP genomic data set. This will allow us to assess patterns of migration and gene flow (stock structure) as well as potential genetic loci under localized natural selection. To date, we have received samples from Florida (*n* = 3), Louisiana (*n* = 2), Alabama (*n* = 1) and Texas (*n* = 11), and sampling has been completed. Genomic sequencing has begun, and preliminary bioinformatics have been completed. Sequencing and bioinformatics are being supported by the Marine Genomics lab at Texas A&M Corpus Christi. We anticipate all lab work will be completed and final data analysis will begin this year. We conducted a side project using these oyster samples, examining morphological (shell shape) differences among oysters at the sample and regional scale. This analysis yielded interesting results that validate previous analyses of population structure based on genetics, and the findings have been written and submitted to a journal.

Black Drum (*Pogonias cromis*) high-resolution population genomics

Previously noted life history differences between black drum from Baffin Bay as compared to other Texas inshore areas suggests the possibility of genetic divergence on a relatively small geographic scale. We have used microsatellite data, mtDNA and discriminant analysis of principle components (DAPC) to demonstrate weak but significant genetic divergence between Baffin Bay and other Texas bays. Samples were selected for a high-resolution genomic library, and these samples have now been sequenced using the reduced-representation "ddRAD" method. Analysis of sequence data is complete, and two papers have been submitted to a journal detailing the findings. Our preliminary findings indicate weak but significant population structure of this species in Texas, and imply at least three regional populations of black drum in the western Gulf.

Detection of white spot syndrome virus (WSSV) in wild Gulf shrimp

We measured the presence and prevalence of white spot syndrome virus (WSSV) in brown and white shrimp from Texas. We collaborated with Dr. Arun Dhar of the aquaculture pathology laboratory, University of Arizona, in obtaining an infection-positive control sample of *Litopenaeus vannamei* (Pacific white shrimp). Additionally, we identified and utilized an appropriate PCR-based laboratory assay for detecting WSSV in Texas shrimp. Sampling has been completed for this study, data is analyzed, and manuscript preparation is under way. We do not intend to collect additional samples for this project.

Detection of shrimp black gill disease in wild Gulf shrimp

We are continuing work on a study on the presence and prevalence of shrimp black gill (sBG) in white (*Litopenaeus setiferus*) and brown (*Farfantepenaeus aztecus*) shrimp in Texas. We have identified the pathogen that seems to drive this condition in Texas, using DNA sequencing technology. In 2019, *n* = 1,605 shrimp (white and brown combined) were sampled and sBG detection was conducted using a PCR test coupled with lab examination/diagnosis. Seasonal patterns in prevalence were identified, as was linkage between prevalence, temperature, and salinity. A paper detailing these findings has been submitted to a journal. We are continuing and expanding our sampling effort for this project. In an effort to assess impacts to Gulf commercial shrimping, we have partnered with Texas Agrilife Sea Grant extension and the offshore shrimp trawl fishing community to expand sampling offshore and link it directly to the industry.

Observation of growth in two sizes of post-release red drum *Sciaenops ocellatus*

We are cooperating with the TPWD stock enhancement branch to determine whether there are differences in growth and body condition between stock enhancement red drum that are above versus below the size targeted at the time of harvest (35 mm). Samples of fish were collected at harvest, and individuals were fit with coded wire tags and released into wet lab tanks. Three trials have been completed (May, August, November 2020) and data analysis is ongoing. Preliminary results suggest that fish below target have a higher mortality rate post-harvest, and there are also differences in daily growth between individuals above and below harvest targets.

Determination of hatching dates in wild southern flounder (*Paralichthys lethostigma*)

Young-of-the-year southern flounder are being collected during fishery independent sampling (TPWD). Otoliths are being extracted from all individuals and daily increment rings are being used to determine hatching dates for southern flounder. Hatching dates will be related back to environmental (water quality) conditions to render understanding of spawning and hatching conditions for southern flounder. In preliminary observations, it appears that daily rings are present and countable. We have also observed accessory growth centers that might be associated with metamorphosis. This year we included a collaborative component to this project with the TPWD stock enhancement program, and we are expecting to receive *n* = 30 YOY flounder spawned in captivity, with known birth dates. Hatchery-reared flounder will be used to validate growth rings and accessory growth centers, and growth and timing of metamorphosis will be compared between wild and hatchery fish.

Taxonomic uncertainty in ladyfish (*Elops saurus versus E. smithi*) in the western Gulf of Mexico

Research conducted in the last decade described a new species of ladyfish, *Elops smithi*, which occurs in sympatry with *E. saurus* in the Gulf of Mexico. It is unknown with what regularity this species occurs in Texas waters. Preliminary observations based on DNA sequencing (in our lab) of ladyfish previously collected in Texas suggest that both species are present. We are in the process of collecting additional

specimens *via* TPWD fishery independent sampling, paired with occasional angling. Morphological characters which diagnose each species are being counted and paired with mtDNA sequencing to take census of these species in Texas' waters. Additionally, if both species are present with regularity, we intend to construct a reduced-representation genomic library in an effort to identify historical admixture or contemporaneous hybridization between species. Expansion of this project to include other Gulf states will be considered, and coordination of this effort *via* GSMFC would be beneficial. These data will be used to clarify the taxonomy of *Elops sp.* in Texas' marine waters and improve our breadth of knowledge of Texas' marine biodiversity.

2. Collaborative projects

Range-wide population genetic structure of alligator gar (*Atractosteus spatula*)

In collaboration with Dr. Brian Kreiser, (University of Southern Mississippi), we are analyzing mitochondrial DNA (mtDNA) sequence data already on hand in our lab, in an effort to examine the range-wide population structure of the species. Dr. Kreiser is analyzing a microsatellite DNA data set, and together we will attempt to compare and contrast historical versus contemporary patterns of movement and demographic exchange among drainages in the Gulf of Mexico basin. Sampling has been completed, and all genetic data has been collected and organized. Analysis of both data sets is nearing completion (mtDNA, Texas Parks and Wildlife; genomic microsatellites, University of Mississippi) and we are moving towards writing a manuscript detailing this effort and its findings.

Age and growth of snook species in Texas' estuaries

In collaboration with biologists from our upper and lower Laguna Madre field stations, we are using otoliths to examine the age structure of common and fat snook (*Centropomus undecimalis* and *C. mexicanus*, respectively) in Texas estuaries. TPWD field biologists are using internal structures of fishes caught in fishery independent sampling to examine sex ratios and fecundity in adult snook species. We are supporting this work by aging snook previously captured in TPWD sampling gear, using thin-sectioning and microscopy of saggital otoliths. Otolith collections are ongoing in the Laguna Madre, but approximately 150 previously collected samples have also been cut and aged to expand the scope of this work.

Taxonomic uncertainty of *Menidia* sp. in Aransas and Galveston Bays

We are supporting the work of Dr. James Derek Hogan who is conducting targeted sampling for a rare all-female silverside species, *Menidia clarkhubbsi*. Dr. Hogan's group is looking for morphological characters that might distinguish this species from other species of *Menidia*, and pairing his analysis with genomic sequencing in an effort to compare genomic loci among *M. clarkhubbsi* and the more common species *M. peninsulae* and *M. beryllina*. We are principally supporting Dr. Hogan's work with sampling effort, but J. Anderson (TPWD) is listed as a cooperator on this work, which is funded *via* a state wildlife grant (TPWD-SWG).

Gulf States Marine Fisheries Commission
Technical Coordinating Committee (TCC), Fall 2021 Meeting
Florida Report

1. Emerging Issues Pertinent to Gulf of Mexico Fisheries.

Barotrauma Mitigation

The Return 'Em Right project is a large-scale outreach and education initiative in the Gulf region to encourage for-hire operators and private anglers to adopt the use of descender devices to mitigate the negative impacts of barotrauma in the recreational fishery for reef fishes. Outreach for the program has begun along the Gulf coast of Florida, and the state has been working collaboratively with GSMFC, along with the states of Alabama and Mississippi to develop a plan for monitoring the success of the program. Since 2009, Florida has deployed fishery observers in the for-hire fishery to monitor the capture and release methods and condition of recreational discards, paired with a large-scale mark-recapture study to evaluate the relative survival of discarded fish. The methods are being adapted to support this new initiative, and similar methods and procedures are also being adopted by other states. New data elements will also be collected in the State Reef Fish Survey to support this project.

Hurricane Disaster Relief

FWC received $44.5 million grant from NOAA Fisheries in June 2019 to help fisheries-related businesses impacted by Hurricane Irma. Staff is continuously working with FWC leadership on details of the programs. Overall, more than $27.2 million in direct payouts have been made to commercial fishers, wholesale dealers, and charter fishermen. Additionally, $1.0 million was spent reimbursing wholesale dealers for facility upgrades or repair, and $1.3 million on marine debris cleanup efforts in the Florida Keys. Projects ongoing for the next several years include $4.2 million for mitigating loss of coral due to the stony coral tissue loss disease, $6.3 million for four habitat improvement projects, and $2.5 million for fishing infrastructure repair projects.

In March 2020, FWC received notification of $7.8 million is relief funding to help fisheries-related businesses impacted by Hurricane Michael. FWC staff, working closely with FWC leadership, coordinated with affected stakeholders to develop a spend plan to mitigate the fisheries-related damages caused by Hurricane Michael. After reviewing submitted public comments, the proposed spend plan was submitted to NOAA in early September 2020, which outlined methods and budgets to provide relief to commercial aquaculturists, fishermen, and wholesale dealers, as well as marinas and licensed charter businesses. NOAA approved FWC's spend plan in August 2021. FWC is currently working with NOAA on finalizing award documents.

In December 2020, Governor DeSantis submitted a federal fisheries disaster declaration request to the Secretary of Commerce to assist with impacted from Hurricane Sally. FWC has not received a response on this request.

CARES Act 1 & 2

On March 27, 2020, President Trump signed the CARES Act into law. One of the law's major provisions related to the fishing industry was $300 million for fishery disaster assistance nationwide. Of that, Florida was allocated $23.6 million. All relief money for Florida fishing-related businesses was distributed by the Atlantic State Marine Fisheries Commission, working in cooperation with FWC. FWC staff, working closely with FWC leadership, developed a spend plan to mitigate the COVID-19 financial impact to the Florida fishery. After reviewing public comments, the proposed spend plan was submitted to NOAA in early August 2020, outlining methods and budgets to provide relief to commercial aquaculturists, fishermen, and wholesale dealers, as well as licensed charter businesses. Applications to eligible fishery participants were mailed in late 2020. Overall, 1,595 qualifying Florida fishery participants received financial relief through this program. Total disbursed funds equal $23,447,010.51. On Dec. 27, 2020, the Consolidated Appropriations Act, 2021 was signed into law. $255 million was allocated for fishery disaster assistance nationwide. Florida was allocated $19.7 million. All relief money was again distributed to the interstate commissions, with Florida working with the Atlantic States Marine Fisheries Commission to distribute the funding to qualified applicants. NOAA approved FWC's spend plan in late June. The process was similar to the methodology used for the first CARES Act project, with only minor changes to the timeframe. Applications to eligible fishery participants were mailed in mid-July. The application period was open for 45 days, followed by a 17-day period to allow for amendments. Over 2,100 applications were received. Currently, FWC is qualifying applications. FWC will submit payment information to ASMFC in early October.

2. Activities Related to Artificial Reef Programs.

Florida Artificial Reef Construction

From October 2020 through August 2021, there were 91 new patch reefs created from a total of 104 artificial reef deployments state-wide that were comprised of 75 prefabricated concrete module deployments (1,002 modules totaling 3,929 tons), 20 secondary-use concrete material deployments (91,390 tons), six limestone boulder mitigation deployments (26,285 tons) and three vessel reef (214 tons). Of the 104 artificial reef deployments, 40 (38%) were funded by the Florida Fish and Wildlife Conservation

Commission (FWC) and 64 (62%) were funded by local government, non-government organizations, and private sources.

The FWC funded artificial reef construction projects were completed utilizing funds from the State of Florida Marine Resource Conservation Trust Fund, the U.S. Fish and Wildlife Service's Federal Sport Fish Restoration Program, and the Natural Resource Damage Assessment (NRDA) Early Restoration Phase III, Florida Artificial Reef Creation and Restoration Project.

Florida Artificial Reef Monitoring and Research

From October 2020 through August 2021, three artificial reef monitoring projects managed by the FWC Artificial Reef Program were completed and five projects are still ongoing. Four artificial reef monitoring projects were located off the Gulf Coast and four off the Atlantic Coast:

Ongoing:

- Oriskany Reef Fish PCB Monitoring Project (Northwest Florida – Gulf)
- Taylor County Volunteer Artificial Reef Monitoring Project (Central Florida – Gulf)
- Artificial Reef Fish Community Dynamics Research, USF (Central Florida – Gulf)
- Economic Impact and Valuation of Southeast Florida Artificial Reefs, NOAA (Southeast Florida – Atlantic)
- Depredation and discard mortality of Permit Monitoring Project, FIU (Southeast Florida- Atlantic)

Completed:

- St. Marks Artificial Reef Monitoring Project, FSU (Northwest Florida – Gulf)
- St. Johns River Artificial Reef Monitoring Project, JU (Northeast Florida – Atlantic)
- Aquarius Reef Base Predatory Behavior Monitoring Project, FIU (Southeast Florida – Atlantic)

Florida Artificial Reef Outreach

During November 4-6, 2020, the 2020 Florida Statewide Artificial Reef Summit was hosted virtually with more than 200 attendees. The summit provided a virtual platform for participants to engage in discussions on artificial reef management and current artificial reef research. The Summit's theme was entitled "Bringing the Future of Florida's Artificial Reefs into Focus," and featured contributions on lessons learned, areas requiring better focus, and visions for the future of artificial reef development in Florida. Originally scheduled for April 2020, the Summit steering committee postponed the event due to

COVID but was able to reschedule and reformat the entire conference to a virtual platform. Presentations from National Marine Fisheries Service, Army Corps of Engineers, State of Florida Fish and Wildlife Conservation Commission, state universities, county coordinators and industry representatives addressed several important topics relevant to the future of Florida's artificial reefs. These topics included environmental mitigation, fisheries management, human dimensions, and regulatory and policy frameworks. The summit closed with a panel discussion that was designed to engage dialogue between a diverse group of panelists and summit participants. The discussion covered a variety of issues and highlighted current fisheries management considerations, including the impact that artificial reefs have on catchability of multiple commercially and recreationally important marine species.

In addition to the presentations listed above, a Keynote Address was delivered by Dr. Bill Lindberg, who has spent almost forty years on the assessment of reef fisheries habitat and the application of artificial reefs in fisheries management. There was also a special "Hindsight is 2020" session that featured Drs. Jim Bohnsack and Heyward Mathews, who together have over a century of artificial reef research experience, as they reflected on lessons learned and the best focus for future efforts. A post-event survey demonstrated that 97% of respondents (n=84) agreed that the virtual Summit was a good use of time and 87% indicated that they learned something they will apply to their work with artificial reefs. These statewide Summits, hosted every five years, continue to foster cohesive research plans and communication with relevant stakeholders for the effective planning of artificial reef research, design and implementation - not only in Florida, but throughout the southeastern US. To view the Summit program, abstracts and watch archived video recordings of all the Summit presentations, please visit: https://www.flseagrant.org/fisheries/artificialreefs/florida-artificial-reef-summit-registration/.

3. Activities Associated with the Gulf of Mexico Crab Fisheries.

Derelict Trap Retrieval Program

The trap retrieval program continues to operate on the Gulf Coast during odd numbered years, and the Atlantic coast during even numbered years. Prior to derelict trap collection, regions are closed to all trap fishing and all "actively fished" traps must be removed by recreational and commercial fishers. It is common for trap closures to be cancelled to alleviate economic hardships associated with hurricanes, red tides, or lack of derelict gear present. In 2021, 289 traps were removed from Wakulla through Dixie Counties (52% commercial, 27% unidentified, 12% recreational, 9% rope/buoy) and 430 traps were removed from Hillsborough/Pinellas through Lee Counties (48% commercial, 9% unidentified, 35% recreational, 8% rope/buoy).

4. Activities Related to Fisheries Dependent Data Collection.

Marine Recreational Information Program

Thanks to additional funds made possible by the Modernizing Recreational Fisheries Management Act, funding through Gulf FIN to support state conduct of the Marine Recreational Information Program's (MRIP) Access Point Intercept Survey (APAIS) in Florida was increased by $600k. This not only helps to improve precision of catch estimates through MRIP for a multitude of recreationally targeted species in our state, but APAIS data also feed into improved estimates for important managed reef fish species monitored through the State Reef Fish Survey (SRFS). Annual sample quotas for the Gulf coast of Florida, including the Keys, increased from 1,781 APAIS assignments in 2019 and 2020, to 3,546 in 2021. Along the Atlantic coast, the annual sample quota increased from 873 assignments in the two prior years to 1,854 in 2021. The APAIS intercept survey in Florida also successfully transitioned from paper data sheets to field tablets. Staff from GSMFC travelled to Florida to conduct a training session for state supervisors in February 2021, and the new method was fully implemented throughout the state by Wave 2.

Scallop Recreational Survey Pilot Study

The recreational scallop fishery along the Gulf coast of Florida has rapidly expanded in recent years. The fishery is concentrated in the Big Bend region and draws recreational participants from across the state and throughout the US southeast region, including from neighboring states of Georgia and Alabama. The recreational fishery is currently managed with a daily harvest limit and open seasons during June-September that vary across five regions. A survey to monitor recreational landings does not exist in the state (invertebrates are excluded from MRIP), and increased funds available in 2021 through the Interjurisdictional Fisheries Act were used to conduct a pilot study to develop new methods for long-term monitoring. Information on fishing effort was collected through an add-on to the State Reef Fish Survey, which included anglers with a saltwater fishing license that are normally ineligible to receive the mail survey questionnaire. A special intercept survey specifically targeting recreational scallopers was also implemented to measure CPUE. Results will be available in 2022.

Commercial Fisheries

Since early 2017, Florida FWC has been working with Bluefin Data, along with Texas, on the development of a new web-based wholesale dealer reporting application (VESL). In Florida, VESL is now used in conjunction with a point-of-sale swipe card system which uses mobile devices such as smart phones and tablets along with mobile/desktop card readers and/or a barcode scanner to validate license and vessel data from the fisher's license card and initiate the electronic trip ticket for the fisher-dealer landing transaction. A state-

only version of VESL has been in production since April 2019 and the full version of VESL with federal fields went into production in January 2021. Florida now has 250+ dealers registered for the web-based application with more dealers added each month. Most new dealers are going to VESL, and the number of federal dealers using the application has increased, though not as much as expected. One draw-back in the application for federal dealers is the absence of the different reports and deductions features that were available in the PC version. We are currently working with Bluefin Data and GSMFC to address these issues.

The 2020 commercial landings information are complete as of July 31, 2021, and subject to revision. Preliminary commercial landings for 2021 are complete through about June. To date, the number of trip ticket records received in 2021 are down about 9% from January-August as compared to the same period in 2020. The reduction in fishing effort may have been affected more by increased red tide blooms along the Florida Gulf coast and weather effects rather than by COVID-19.

Starting in January 2021 under a grant through the Gulf States Marine Fisheries Commission, Florida began participation in sampling for under-sampled interjurisdictional (IJ) fisheries such as blue crab, stone crab, shrimp, oysters, mullet, flounder, sheepshead, baitfish, and other potentially under-sampled species from Florida's state waters. Sampling is being conducted using NOAA Fisheries Trip Interview Program (TIP) sampling protocols, and all biostatistical data collected from IJ species are recorded in the TIP database. Through August, samplers have conducted 198 interviews resulting in 8,111 fish measured and 4,981 hard parts collected. Due to the effects of COVID-19, hiring was delayed during the first quarter with the first staff hired in late March. Also, there has been frequent staff turnover in two of the Florida West coast positions which has contributed to lower numbers of intercepts and samples than expected. Currently, samplers are trained and in place in all project positions.

During 2021, Florida FWC commercial field staff continued to conduct bio-statistical sampling for the NOAA Fisheries Trip Interview Program (TIP) using established COVID-19 safety equipment and protocols. Through August of 2021, sampling of commercial catches along the Gulf coast of Florida accounted for 367 TIP interviews, almost 14,253 fish measured, and nearly 7,374 age structures. While the number of interviews and samples performed so far in 2021 are down slightly from 2020, the number of interviews and fish measured are down 27% and 25% respectively as compared to pre-COVID 2019 numbers. While the effects of COVID-19 are still noticeable regarding sampling, Florida also experienced a wide-spread red tide bloom and weather events along the Gulf coast that also likely impacted sampling efforts. TIP sampling in Florida is funded from a variety of funding sources that include: State of Florida, NOAA Fisheries, Gulf FIN and NFWF.

Southeast Headboat Survey activities supported through Gulf FIN

As mentioned in the 2020 report, Florida FWC and NOAA Fisheries halted field sampling activities in the Southeast Headboat Survey as of April 4, 2020 due to COVID-19. By June 2021, it was determined that field staff could commence conducting survey interviews and sampling in a safe manner following CDC and agency protocols starting July 1, 2021. While Florida state samplers did begin sampling again as of July 1, and

continue sampling under Florida's phase II status, NOAA Fisheries went back to a phase 0 status putting a hold on federal sampling due to the uptick in Delta variant cases of COVID-19. To date, a total of 60 intercepts were conducted by state field staff along Florida's Gulf coast with 1,538 fish sampled during July and August.

Southeast For-hire Integrated Electronic Reporting Program (SEFHIER)

This survey was slated to begin in early 2021, but NOAA Fisheries later set a start date of September 1, 2021 in part due to COVID-19, and also to better prepare vessel Captains with electronic reporting protocols and give states time to hire and train field staff. Florida is currently in the hiring phase and will conduct training with hired staff in October.

5. Activities Related to Fisheries Independent Sampling.

   During the current reporting period, some fishery independent monitoring activities conducted by the state of Florida were reduced to better align sampling with available funding. Completed activities, and summaries include:

   - Monthly, long-term estuarine monitoring in five Gulf of Mexico estuaries (Apalachicola Bay, Cedar Key, Tampa Bay and Charlotte Harbor) continued in 2021. Monthly sampling was conducted with 21.3-m seines and 183-m haul seines in the estuaries and rivers, while bi-monthly sampling was conducted with 6.1-m otter trawls in the rivers and quarterly sampling was conducted with 6.1-m otter trawls in the estuaries to better align sampling with available funding.
   - Bimonthly sampling in Sarasota Bay has been completed through September 2021 and will continue through 2021 and in 2022, with funding from the Sarasota Bay Estuary Program. Beginning in 2022, sampling effort will be reduced to better align sampling with the funding amount.
   - Supplemental (June – November), monthly polyhaline seagrass monitoring was conducted in five Gulf of Mexico estuaries (St. Andrew Bay, Apalachicola Bay, Big Bend, Tampa Bay, and Charlotte Harbor) using 6.1-m otter trawls.
   - Monthly supplemental sampling in the western Panhandle (Santa Rosa Sound and Fort Walton area) for Spotted seatrout using 183-m haul seines and 6.1-m otter trawls began in June and is expected to continue through November 2021.
   - Seasonal sampling was conducted in five estuarine areas of the Everglades National Park (ENP; Ten Thousand Islands, Broad River, Lostmans River, Shark River, and Whitewater Bay) with 21.3-m seines, 183-m haul seines, and 6.1-m otter trawls in April 2021. We anticipate continued funding from the National Park Service for 2022, with sampling occurring in April and October 2022.
   - Monthly updates on abundances of 8 taxa in southwest Florida (Tampa Bay, Sarasota Bay, and Charlotte Harbor) were provided to FWRI and the FWC

Commission to continue evaluating red tide impacts on inshore fish populations and assist with state fisheries management decisions for Common snook, Red drum, and Spotted seatrout.

- The summer SEAMAP groundfish trawl survey was conducted as planned using 12.8-m trawls.
- The annual (May – October) reef fish video and habitat mapping survey is ongoing; to date approximately 90% of planned sampling effort has been completed using stationary-baited remote underwater video arrays and side scan sonar to survey artificial and natural reef habitats.
- A three-year MARFIN project was recently funded to continue a long-term fishery-independent hooked-gear index and explore alternative techniques for improving diversity of fishes collected. This project will begin in April 2022.
- The state of Florida is part of a large team selected to estimate the absolute abundance of Greater Amberjack in the Gulf of Mexico and South Atlantic. Although primary survey efforts will not be conducted until 2022, gear testing and calibration studies will likely begin this fall.
- Processing of survey-related trophodynamics data in support of ecosystem-based fishery management continued.

During this period, we finalized the development of indices of abundance of video survey data for Gag in association with SEDAR, and also examined video survey data in association with the stock identification process in advance of the upcoming Red Snapper research track assessment. We are also involved in the development and planning of research efforts associated with an upcoming SEDAR procedural workshop focused on fishery independent index development under changing survey design.

6. Other State Activities.

SEDAR 64 Southeastern US Yellowtail Snapper

According to the SEDAR 64 Base Model, the southeastern U.S. Yellowtail Snapper population is not overfished or experiencing overfishing and the population is estimated at over two times the minimum stock size threshold (MSST). Status designation of this stock has not changed since the first assessment (SEDAR 3).

The South Atlantic (SAFMC) and Gulf (GMFMC) SSCs jointly met on July 21-22, 2020 to review the SEDAR 64 Yellowtail Snapper assessment and recommend fishing levels for this stock. The SSCs deemed the assessment best scientific information available and useful for management. The stock was found to be not overfished and not undergoing overfishing, with the biomass indicator being well above its reference point (SSB/SSBF30%SPR = 1.69) and the fishing mortality level indicator being well below its reference point (F/F30%SPR = 0.67).

2020 Common Snook Stock Assessment

The stocks of Common Snook on the Atlantic and gulf coasts of Florida were treated as separate management units, based on genetic differences, and consequently assessments were conducted separately for each coast from 1986-2019 using the ASAP (Age-Structured Assessment Program) model.

The Commission's management objective for Common Snook is to maintain the spawning potential ratio (SPR) at or above 40%. The transitional SPR (tSPR) has been used to determine whether the stocks meet this objective. Furthermore, the current fishing mortality rate (defined as the geometric mean of the last three years' fishing mortality rates, F_geo) has been compared to the fishing mortality rate associated with 40%SPR ($F_{40\%SPR}$) along with the comparison of the SSB in the terminal (SSB_{2019}) with the SSB produced by $F_{40\%SPR}$ ($SSB_{40\%SPR}$). In this context, the stock is meeting the Commission's management objectives (1) if F_geo is less than $F_{40\%SPR}$ or the ratio F_geo/$F_{40\%SPR}$ is less than 1.0; and (2) the current spawning biomass (SSB_{2019}) exceeds $SSB_{40\%SPR}$ or the ratio $SSB_{2019}/SSB_{40\%SPR}$ is greater than 1.0.

Following base ASAP model results, the 2019 tSPR values were 52% on the Atlantic coast and 54% on the gulf coast. The Atlantic coast's ratios F_geo/$F_{40\%SPR}$ (0.86) and $SSB_{2019}/SSB_{40\%SPR}$ (0.96), were less than 1.0. The gulf coast's ratio F_geo/$F_{40\%SPR}$ was 0.5 and the ratio SSB_geo/$SSB_{40\%SPR}$ was 1.36. Thus, the tSPR and the F- and SSB-ratios provided mixed results on the Commission's management objectives on the Atlantic coast, but both criteria met the Commission's management objectives on the gulf coast.

2020 Red Drum Stock Assessment

This report assesses the status of Red Drum populations found in four regions along the Atlantic and Gulf coasts of Florida from 1989-2019. Stock status for Red Drum in Florida is based on reference points using an estimated 40% escapement rate in all regions. Here, we present current (geometric mean of 2017-2019) escapement estimates for the four regional SS base models.

Estimates of current escapement rates (geometric mean of the last 3 years, 2017-2019) in the NW, SW, and NE regions exceeded the Commission's target of 40%. Although the SE region of Florida is exceeding the escapement rate management target in the terminal year (2019) of the assessment (55%), it does not meet the current escapement rate management target. Current escapement rates for 2017-2019 were 48% in the NW, 72% in the SW, 61% in the NE, and 35% in the SE region.

The FWC emergency regulatory catch and release measures in response to the 2018-2019 red tide event in the SW region of Florida resulted in decreased landings and lower estimated fishing mortality, as well as higher escapement rates due to increased survival of sub-adult red drum.

Alabama State Report
Gulf States Marine Fisheries Commission's
Fall 2021 – Virtual meeting

Emerging Issues Pertinent to Gulf of Mexico Fisheries.

1. Regulatory/Administration

Most of the renovations planned for the Alabama Marine Resources Division (AMRD) office building on Dauphin Island were completed in August 2021. Renovations included roof and air conditioning replacement, insulation and building exterior repairs and repainting. Additional renovations to the maintenance shop and boat docks are scheduled to begin later this year.

The AMRD determined final distribution amounts for those individuals and business entities who applied to Round I of Alabama's Coronavirus Aid, Relief and Economic Security (CARES) Act program and met the eligibility criteria. Distribution amounts and payment information was provided to the Gulf States Marine Fisheries Commission for payment. The application period for Round II of Alabama's Coronavirus Aid, Relief and Economic Security (CARES) Act program closed August 6, 2021. AMRD has determined 66 applications out of 86 applications received in Round II were eligible for distributions. Preliminary calculations indicate each eligible applicant will receive $0.1377 of CARES funds for every dollar in claimed damages. Preliminary individual distributions were mailed to applicants and responses to these letters are being received. Final calculation of awards will be determined in the coming weeks and checks will be distributed thereafter.

Activities Related to Artificial Reef Programs.

Phase II of the National Fish and Wildlife Foundation Alabama Artificial Reef and Habitat Enhancement Project continues to provide funding for reef fish habitat enhancement and monitoring projects in the inshore, nearshore, and offshore waters of Alabama.

The AMRD acquired authorization from the Army Corps of Engineers to designate approximately 115 square miles of water bottoms as artificial reef zones. These newly permitted water bottoms include approximately 48 square miles between 6 and 10 miles offshore of Baldwin County, approximately 62 square miles between 10 and 20 miles offshore of Mobile County, and four reef sites in Mobile Bay. A $742,724.42 contract to perform a Phase I cultural resource survey, required for compliance with Section 106 of the National Historical Preservation Act, was completed to meet federal regulatory requirements for permit evaluation. Additionally, a formal consultation with the National Marine Fisheries Service was initiated to confirm compliance with Section 7 of the Endangered Species Act. As a result of the

consultation project plans were amended to mitigate impacts to threatened/endangered species and their critical habitats. Shortly after permit authorization a $4,993,200 contract for the construction and deployment of 456 concrete and limestone reef modules measuring 25 feet in height was executed and deployments in the newly permitted reef zones are underway. Additionally, a $2,400,000 contract to construct and deploy 1,203 juvenile reef fish shelters has been executed and deployments in the newly permitted reef zones are underway.

A total of 300 individual reefs constructed by members of the public were inspected and permitted by AMRD staff for deployment in the Offshore General Reef Permit Zones offshore of Alabama. A majority of the reef structures consisted of chicken transport cages, prefabricated concrete reef modules, and steel framed boxes. The structures were deployed between approximately 15 miles to 50 miles offshore of Alabama along water bottoms authorized for artificial reef construction activities.

Activities Associated with the Gulf of Mexico Crab Fisheries.

No derelict trap collection program has been conducted in 2021. AMRD continues to monitor the number of derelict traps and is currently working with our partners to determine if a derelict cleanup will be conducted in 2022.

Activities Related to Fisheries Dependent Data Collection.

1. APAIS

AMRD continued the collection of dockside Access Point Angler Intercept Survey (APAIS) interviews and validation of charter vessel activity. APAIS intercept surveys transitioned from paper to tablet-based data collection and submissions beginning March 1, 2021. From January 1 through August 31, 2021, AMRD samplers completed a total of 354 out of 376 APAIS assignments and 4,439 anglers were interviewed. During the reporting period, a total of 22 of 376 (6%) scheduled assignments were cancelled. Most of the cancellations were due to weather conditions associated with tropical storms (Tropical Storm Claudette and Hurricane Ida). Semi-annual training and fish tests were given to APAIS staff in February and August.

2. Biological sampling

The Biological Sampling Program for the collection of otoliths from recreationally harvested marine finfish continued during the reporting period. From January 1 through August 31, 2021 a total of 453 sets of otoliths with 15 additional length measurements representing 13 out of 13 primary target species were collected by AMRD's staff. Additional funding from the Gulf States Marine Fisheries Commission to continue this program started on September 1, 2021 and will continue for 16 months.

3. Snapper Check

Alabama's recreational Red Snapper season has remained open since its opening on May 28. The season has consisted of four-day weekends (Fri.-Sun.). As of September 20, 6,342 landing reports were received from anglers on private recreational vessels and 585 reports were received from state-licensed charter boats. Through September 20 870,523 pounds (77.5%) of the quota of 1,122,662 pounds has been caught. Poor boating weather in June including the landfall of a tropical storm near Alabama and the proximity of one tropical storm and a hurricane later in the season have impacted fishing effort this year. Beginning in 2021, mandatory reporting of Gray Triggerfish and Greater Amberjack landed in Alabama was required for recreational vessels. For Gray Triggerfish, 1,159 and 54 landing reports were submitted from anglers on private recreational and state-licensed vessels, respectively. The total number of landing reports with Greater Amberjack submitted by anglers on private recreational and state-licensed charter vessels was 219 and 4, respectively.

Activities Related to Fisheries Independent Sampling.

1. Shellfish

Analyzing the 2021 oyster reef quadrat surveys, the AMRD decided to open the public oyster reefs to harvest on October 4, 2021, pending the results of Alabama Department of Public Health (ADPH) sampling after high river discharge caused a closure of all areas to shellfish harvest on Aug 31. The ADPH will begin sampling on 9/21 to make its decision. The 2021 quadrat samples had similar density of legal-sized oysters to that of the 2020 samples and it is expected that the oyster harvest will be similar in 2021 to the harvest in 2020. The 2021 samples also showed a reduction of spat and sublegal oysters from 2020 which may lead to future reduced harvests. The possible reason for reduced spat and sublegal oyster abundance is extended washes of fresh water occurring for 89 days from February to March of this year and again for 55 days from June to August.

The AMRD will also open the reefs on the first four Saturdays of the season to provide an opportunity for youth participation in the harvest. More Saturdays may be added if there is adequate participation from younger harvesters. On these Saturdays, the reefs will be open to harvest for all commercial and recreational harvest, however the reefs will close at 12:00 pm instead 2:00pm.

During the 2021 oyster season, AMRD will continue to use our oyster reef grid system to manage harvest on individual reef areas. The AMRD will monitor grids in which harvest is taking place and open and close specific grids as needed to move oyster catchers off sufficiently harvested areas so that there is a more even distribution of harvest across productive reefs. Harvesters will be able see which grids are open and monitor their position within the grid system by accessing a web link on their smart phones.

The AMRD is introducing a new recreational harvest tag that will be sold at the Oyster Management Station during the commercial harvest season in 2021. Recreational harvesters will be required to purchase a tag and attach it to whatever container is holding their recreational harvest. Recreational harvesters will still be able to harvest up to 100 legal-sized (min 3 in) oysters per person per day. Oysters can only be harvested on reefs and at times open to commercial havers. Introduction of this tag will allow AMRD to collect data on recreational harvest which has been difficult to determine in the past.

The AMRD obtained Natural Resources Disaster Assessment (NRDA) funding for the construction of an Eastern oyster hatchery and remote larval setting facilities. Construction should begin in spring of winter of 2021 with oyster spat production anticipated summer of 2022.

2. SEAMAP

SEAMAP activities were completed for vertical line, nearshore bottom longline and trawl surveys. The trawl cruise was completed in conjunction with Gulf Coast Research Laboratory as staff from Alabama and Mississippi are working from the same vessel for sampling from statistical zones 8-12. Vertical line fall sampling was completed 25 stations; catches comprised of six species totaling 146 fish with Vermilion Snapper being the next most abundant species after Red Snapper. Bottom longline surveys were completed at 11 stations and comprised of twelve species. Atlantic Sharpnose and Blacktip Sharks were the most abundant species from the nearshore bottom longline. Depredation on the bottom longline was higher than normal (<1%) during June and July with a rate of 3% of the hooks fished or 15.6% of the specimens retrieved.

3. Inshore Gillnet

From January through August 2021 gillnet sampling was conducted each month using small mesh perpendicular sets with mesh ranging from 2-4 inches, and large mesh parallel sets with mesh ranging from 4.5-6 inches. A total of 155 of 158 scheduled hour-long sets were completed with a total of 52 different species sampled comprising 4,451 observed individuals. Hurricane Ida, bad weather, and staffing issues prevented us from completing 3 net sets in August. Over 600 otoliths were collected from captured individuals and measurements of length, weight, sex, and gonad weight were also taken. Gulf Menhaden scales and otoliths age comparisons were completed and submitted early this year. The table below is a list for each species of number caught, catch per unit effort (net sets), and otoliths collected from January through August 2021 from gillnets, trawls, seines, marine enforcement seizures, and other sources.

Species	Caught	CPUE	Otoliths		
			Gillnet	Trawl	Enforcement/ Other
Atl. Croaker	438	2.8442	113	--	--
Black Drum	36	0.2338	35	--	--
Bluefish	6	0.039	2	--	--
Florida Pompano	2	0.0065	2	--	--
Gulf Flounder	0	0	--	3	--
Gulf Kingfish	0	0	--	--	--
Gulf Menhaden	1019	6.6169	--	--	--
Gray Snapper	0	0	--	1	--
Red Drum	30	0.1948	27	2	--
Southern Kingfish	12	0.0779	20	--	--
Striped Mullet	415	2.6948	251	--	--
Sand Seatrout	15	0.0974	17	--	--
Sheepshead	12	0.0779	12	--	41
Southern Flounder	3	0.0195	--	1	--
Spanish Mackerel	44	0.2857	40	--	--
Spotted Seatrout	410	2.6558	402	--	--
White Mullet	176	1.1429	114	--	--
Totals*	**2618**	**--**	**1035**	**7**	**41**

**Total catch of fish species listed above.*

Other State Activities.

1. Mariculture

The Claude Peteet Mariculture Center (CPMC) continued stock enhancement efforts through the spring and summer of 2021. As of mid-September, an additional 69,000 Spotted Seatrout were released into coastal Alabama waters. One more trout spawn is planned for 2021. CPMC continues to build on the success of their Southern Flounder program. In the winter/spring of 2021, approximately 35,000 1-inch fish were released. This number was up almost 20,000 from the previous year, and the expectation is to double the production in 2022 and reach the current annual stocking goal. Research projects concerning the cryopreservation of Southern Flounder sperm will continue in the winter of 2022. Systems are currently being renovated to accommodate these projects. Florida Pompano spawning efforts have not met expectations. Transitions to a new spawning hormone have proposed a new set of challenges. Thus far, only 7,000 fish have been released this year. Two more spawning events are planned for 2021.

CPMC staff assisted researchers from Auburn University who have been contracted using Inter Jurisdictional Funds (IJF) to conduct a cryogenic preservation study of Southern Flounder sperm. Results from spawning activities conducted in 2020 indicated procurement, maturation and sperm collection timed with egg development in females is somewhat problematic. The purpose of the research is to determine the most appropriate technique to maximize sperm survival and motility after cryopreservation and determine the ideal amount of sperm needed maximize fertilization. Having Southern Flounder sperm stored for future use could lead to greater fertilization success and more efficient use of sperm. The results from the initial collection in January yielded positive results and a second trial will begin in January 2022.

2. Boating Access

Repairs to the parking areas of the Boggy Point and Fish River boat ramps have been completed. Fort Morgan Boat ramp remains under active renovations to remove sedimentation from the basin and construction of a fishing pier. Shoreline stabilization-and expansion and resurfacing of the parking area at the Delta Port boat launch are expected to be completed by the end of September 2021. The Pines boat ramp remains closed and its renovation is being evaluated.

3. Outreach

The AMRD Fisheries and Enforcement sections participated in one outreach event with school children. The Alabama Seafood Marketing Program continued with public relations, television commercials, print ads and articles, radio ads, billboards, distribution of marketing materials and sponsorships of events. The marketing program's website is www.eatalabamaseafood.com.

4. Enforcement

From March 2021 through September 2021, AMRD enforcement officers conducted 750 commercial fishermen intercepts, 8,603 recreational fishermen intercepts, 484 seafood dealer and processor inspections, 6,684 hours of patrol (combined vessel patrol and shore patrol) and boarded 2,121 vessels.

In 2021, the National Marine Fisheries Service has implemented a new requirement for the Federal For-Hire charter fishing industry, Southeast For-Hire Integrated Electronic Reporting Program (SFHIER). This program requires all Federally permitted for-hire charter fishing vessels to electronically report each of their fishing trips, along with total number of fishermen and a summary of fishes caught and their quantities. AMRD enforcement officers have been very active during the peak of the charter fishing season in helping ensure that the vessels were reporting as well as helping educate the captains on the new program.

As the Covid-19 rules have begun to change and allow more social interaction, the Enforcement Section's participation in outreach events has begun to increase. The Enforcement and Fisheries Sections continue to participate in outreach events.

In January 2021, the Enforcement Section received final approval for expansion of the Coastal Remote Monitoring System. Funding was provided though a $273,865 2019 FEMA Port Security Grant. The expansion will update and expand the capabilities of the network of cameras throughout coastal Alabama. Several new camera locations were added, in addition to installing new cameras in existing locations and an upgraded management system. The system has the ability to store high-definition video of boating access points and other high values areas for an extended period of time.

The Enforcement and Fisheries Sections continue work on the grant intended to monitor and protect marine mammals and marine turtles. The grant included monitoring for turtle crawls and nesting areas. Additionally, the grant provided funding to educate the public and enforcement about marine mammal and turtle interactions and how current laws related to these interactions are crucial to the protection of marine mammals and marine turtles. Two portable camera units that are solar/battery-powered and feed into the MRD Coastal Remote Monitoring System were purchased in the grant. Both were successfully deployed this past turtle nesting season. The cameras track turtle movement, human interaction and monitor known nesting sites.

Gulf States Marine Fisheries Commission
Technical Coordinating Committee
Mississippi State Report (January 1, 2021 – June 30, 2021)

1. Emerging Issues Pertinent to Gulf of Mexico Fisheries

CARES Act

Mississippi received $1,520,087 CARES Act I funds, and those funds were distributed to eligible commercial fishermen, charter fishermen and seafood dealer/processors in an equitable manner.

The first round of CARES Act funding resulted in 223 eligible participants by MDMR. This eligible group consisted of 168 commercial fishermen, 42 charter captains, and 13 dealers. Mississippi residents with the eligible in-state and out-of-state licenses self-certified over 35% lost revenue for the varying months identified in the spend plan, when compared to the same months in previous years.

Mississippi will receive $2,960,079 CARES Act II funding, also known as the Consolidated Appropriations Act of 2021. The spend plan was drafted in May and resembles the approved CARES Act I procedure. Revisions aimed at addressing NOAA's ongoing comments continued through June.

2. Activities Related to Artificial Reef Programs

The Artificial Reef Bureau (ARB) continued monthly monitoring of fish assemblages and physiochemical parameters at selected inshore reef sites.

In conjunction with the Gulf States Marine Fisheries Commission (GSMFC), the fourth annual Jimmy Sanders' Memorial Lionfish Challenge began May 14, 2021 and will run through December 1, 2021. Nine participants harvested a total of 31 invasive lionfish to date.

In December 2020, ARB staff began deployments of materials donated by Ingalls Shipyard into FH-13. This project contributed 8,096 tons of materials that created 9 new artificial reef sites. Staff also deployed 6,171 tons of concrete on Katrina Key, which expanded the reef 810 linear feet to the west. A total of 244 pieces of materials of opportunity (8 loads of concrete) was also donated to ARB and will be used for further creation of artificial reefs.

ARB staff obtained permit renewals for MP132 and MP280.

3. Activities Related to Fisheries Dependent Sampling

MRIP

The Finfish Bureau (FB) continued to oversee the Marine Recreational Information Program (MRIP) in Mississippi. A total of 237 assignments and 934 surveys were completed January through June 2021 in Jackson, Harrison, and Hancock Counties.

Trip Tickets

Finfish Bureau (FB) collected commercial landings data from processors, dealers, and fishermen utilizing the Mississippi Trip Ticket program. This data allows management of the resource and effective monitoring of the quota on Red Drum, Spotted Seatrout, and Southern Flounder. From January through June 2021, there were 2,212 paper and electronic trip tickets submitted by 267 active commercial fishermen and 100 dealers participating in the trip ticket program. The number of commercial fishermen selling their catch using a Fresh Product Permit and participating in the trip ticket program was 88. The FB and the Shrimp and Crab Bureau (SCB) is continuing to work with BlueFin Data to develop the electronic trip ticket reporting application known as VESL. A beta version has been tested and VESL will go live on July 1, 2021. FB and SCB are also working with BlueFin Data to develop an electronic harvester ticket for Mississippi Off Bottom Oyster Aquaculture (OBOA) and an electronic monthly dealer ticket for the Mississippi Live Bait industry. The finalized forms are expected to be completed concurrently with the electronic trip ticket system and will be available to OBOA harvesters and live bait dealers tentatively in 2022.

Age and Growth

The FB collected and processed 389 otoliths as part of the MDMR Biological Sampling Program from ten select species: Black Drum, Red Drum, Sand Seatrout, Sheepshead, Southern Flounder, Southern Kingfish, Spotted Seatrout, Striped Mullet, Red Snapper, and Gray Snapper.

Tails ‘n’ Scales

Mississippi’s recreational Red Snapper electronic reporting system, Tails n’ Scales was updated for use in the 2021 season. Under amendment 50c passed by the Gulf of Mexico Fisheries Management Council, Mississippi managed the 2021 recreational Red Snapper season in state and federal waters. The state charter for-hire and private recreational components were integrated with a season opening date of May 28. The federal for-hire season was projected to last 62 days, although vessels with federal reef fish permits were not included under amendment 50c. Mississippi’s total Annual Catch Limit (ACL) for the 2021 season was 151,550

pounds for both the private recreational and state charter for-hire components. The Tails n' Scales reporting system began offseason maintenance and updates.

4. Activities Related to Fisheries Independent Sampling

Finfish Sampling

Long-term fishery independent sampling continued in conjunction with the NOAA Project "Monitoring and Assessment of Mississippi's Interjurisdictional Marine Resources". The FB completed 56 gill nets at ten stations to collect finfish species for subsequent age-and-growth analysis as well as other biological data. A total of 205 otoliths were collected from January through June 2021 and samples were collected from nine different species: Striped Mullet, Red Drum, Spotted Seatrout, Sheepshead, Black Drum, Southern Kingfish, Southern Flounder, Sand Seatrout, and Gulf Kingfish.

Through a project funded by the USFWS Sport Fish Restoration Program, the FB intends to deploy 10 additional satellite tags on Atlantic Tripletail in the fall of 2021 as continuation of the 2019 and 2020 Atlantic Tripletail deployment dataset.

The acoustic telemetry work funded by the USFWS Sport Fish Restoration program for interagency, cooperative tracking of multiple species in Mississippi state waters continued. Acoustic receivers in the project array continued to undergo routine cleaning, maintenance, and data downloads. Range tests were performed in the eastern Mississippi Sound to determine a receiver's ability to detect acoustic transmitters at various distances and in varying conditions. Additional acoustic transmitters are scheduled for deployment on Southern Flounder in 2021.

The Fyke Net sampling program, which is used to target Southern Flounder, resumed in May 2021. Fyke nets were set and retrieved on a bi-weekly basis at the three original sampling locations (Davis Bayou, Deer Island, and Belle Fontaine). A total of five sampling events occurred in the Months of May and June. During these events, a total of 10 Southern Flounder were collected. Other species observed in the fyke nets included Blue Crab, Red Drum, Atlantic Croaker, Hardhead Catfish, Atlantic Spadefish, Black Drum, Spot, Spotted Seatrout, Sheepshead, Striped Mullet, Gizzard Shad, and Alligator Gar. Through the help of additional funding, two more fyke net sites were established in the lower Pascagoula River. However, due to weather restrictions, sampling did not occur until late June. The two sites were only sampled once and had a total of eight Southern Flounder. Sampling is anticipated to continue through November 2021.

Shrimp and Crab Sampling

The Shrimp and Crab Bureau (SCB) continued to conduct monthly fishery independent trawl sampling under the project "Monitoring and Assessment of Mississippi's Interjurisdictional Marine Resources". This sampling program includes 14 fixed stations located in the western Mississippi Sound and along a transect from Horn Island to the upper end of the Back Bay of Biloxi. Sampling was conducted using a 16' otter trawl with liner in the cod end. A total of 88 trawls were completed from January to June 2021.

The SCB continued fishery independent trap surveys for blue crabs within three major estuaries – St. Louis Bay, Back Bay of Biloxi, and the lower Pascagoula River. Each estuary was sampled monthly from January to June 2021 for a total of 18 sample sets. This program, which began in September 2014, provides data on CPUE, size and sex composition, blue crab abundance, and bycatch composition and 255 sample sets have been completed since the beginning of the project.

The SCB continued to conduct monthly fishery independent shrimp trawls to monitor seasonal abundance of penaeid shrimp within the Mississippi Sound. This sampling program includes 10 fixed stations located across the Mississippi Sound from the mouth of St. Louis Bay east to Round Island using a standard 16' otter trawl. Sampling frequency increases to weekly in April and twice per week in May to monitor brown shrimp growth. A total of 143 trawls were completed from January to June 2021.

The SCB implemented a new fishery independent study using experimental gear types in Mississippi coastal waterways. The program was funded through the GSMFC IJ State Research Funding (SuRF) Program. Two smaller otter trawls – 6' and 12' – were tested for collection of juvenile size classes of select finfish, penaeid shrimp and blue crabs. Two samples were collected with each trawl in each of the three coastal counties at randomly selected sites each month. A total of 72 small trawls were completed from January to June 2021.

The SCB also began a fishery independent crab trap survey in Mississippi commercial blue crab harvest waters. Six crab traps were placed in a randomly selected site in each of the three coastal counties every month to provide data on CPUE, size and sex composition, blue crab abundance, and bycatch composition. A total of 108 traps were set and pulled from January to June 2021.

Shellfish Sampling

The MDMR Shellfish Bureau (SB) conducts an extensive oyster reef assessment on all significant public oyster resources in state waters each year. This assessment includes one-minute dredge tows and diver square meter samples for analysis of oyster health, growth, productivity, abundance, and predatory behavior. This data is used for resource management and

enhancement. From January 1 through June 30, 2021, the Shellfish Bureau conducted 124 dredge tows, 175 square-meter samples, and cultivated 160 acres of the western Mississippi Sound.

5. Other State Activities

State Records for Recreational Fishing

A total of seven recreational fishing records were approved as state records between January 1 and June 30, 2021. All tackle category records had two approved record submissions: Almaco Jack (*Seriola rivoliana),* spear, and Red Lionfish (*Pterois volitans*), spear. There were three Conventional Tackle records approved: Gag (*Mycteroperca microlepis*), Gulf Flounder (*Paralichthys albiguttata*), and Swordfish (Xiphias gladius). There were also two youth records approved during the timeframe: Gag and Gafftopsail Catfish (*Bagre marinus*).

Live Bait Shrimp Licensing and Special Permits

The SCB manages the live bait shrimp licensing program. Inspections and technical assistance were provided, as needed, to the 11 licensed dealers across Mississippi's three coastal counties. The SCB also manages the MDMR Special Permitting program which includes Scientific Research Permits, Brood Stock Permits, Non-profit Harvesters Permits, and Experimental Gear Permits. SCB staff issued 36 Special Permits from January to June 2021.

Skimmer TED Reimbursement Program

MDMR Office of Marine Fisheries staff continued development and implementation of a program to reimburse shrimpers who purchase turtle excluder devices (TEDs) for their skimmer vessels. This project is intended to mitigate financial impacts to those vessels affected by the National Marine Fisheries Service (NMFS) December 20, 2019, final rule, which requires all skimmer vessels 40' in length and larger to use TEDs in their nets beginning August 1, 2021. Approximately 20 shrimpers were reimbursed for their purchase of a TED from April to June 2021.

Derelict Crab Trap Removal Program

The SCB organized and held a public derelict crab trap cleanup January 28 to January 30, 2021. The public cleanup resulted in the removal of 310 derelict traps from the Mississippi waterways. The Mississippi Derelict Crab Trap Removal program began in 1999, and to date, has removed a total of 22,250 traps from Mississippi state waters.

Oyster Aquaculture

The Shellfish Bureau (SB) began training the fourth class of Off-Bottom Oyster Aquaculture Program (OBOA) in 2021. The Off-Bottom Oyster Aquaculture Program addresses all aspects of off-bottom oyster farming appropriate to the local and regional area in oyster aquaculture operations, including business development and aquaculture methodologies. Participants will be positioned to operate and maintain economically and environmentally sustainable off-bottom oyster farms in the state of Mississippi, increasing the quantity and value of Mississippi's annual oyster harvest. MDMR established a two-phase off-bottom oyster aquaculture program, as well as offered post-program business incubation services. Phase 1 of the program included classroom and field education on aquaculture, business operations and demonstrations of off-bottom aquaculture techniques. During this phase, participants received the training and assistance needed to deploy and manage approximately 10,000 oysters with the use of MDMR rental equipment such as cages and bags as well as the MDMR small and large tube tumbler. During Phase 2 of the program, training participants opened their own off-bottom oyster aquaculture operations and continued training with instruction from the program to refine skills before beginning an individual operation.

The acreage of available off bottom leases has also increased from 2018 to 2021 in a total of three phases. Phase I included the ten-acre aquaculture training park and 75 acres available for commercial lease. In 2021, Phase II comprised of 135 additional acreages to the west of Phase I, providing commercial oyster farmers with a deep-water profile option as well as closer to the Biloxi Small Craft Harbor. In 2021, the final Phase III became available to commercial farmers which opens an additional 245 acres. Phase III is located north of Phase I and II, giving farmers the opportunity to farm in more shallow waters closer to Deer Island. There is now a total of 465 acres available for commercial farming. The continuation of MDMR Off Bottom Oyster Aquaculture Program will allow aquaculture staff to train more farmers and lease out all acreage in approximately five to ten years. MDMR currently has 51 acres leased by 24 farmers and upwards of 2.8 million oyster seed being cultured. Commercial operations harvested approximately 126,785 oysters from January to June 2021.

Harmful Algal Bloom (HAB) Events

No significant HAB events occurred in the Mississippi Sound and relevant fishery areas in January through June 2021.

Shellfish Management

The MDMR Shellfish Bureau monitors water quality and maintains molluscan shellfish growing water classifications as defined by the National Shellfish Sanitation Program through the Shellfish Sanitation and Compliance Program. This monitoring program mitigates the risk to human health from consuming raw oysters contaminated by fecal coliforms. These bacteria indicate the possible presence of pathogenic bacteria, viruses, and protozoans found in human

and animal wastes. In addition to maintaining oyster growing waters classifications, the water quality samples are used to manage the openings and closings of oyster reefs for harvest. The samples are collected in sterile bottles by boat one-half meter below the surface on the windward side and transported to an FDA certified microbiology laboratory for analysis. During the months of January to June 2021, Staff collected 371 routine water samples and 1 tissue sample from 62 sites across the Mississippi Sound.

Seafood Technology Bureau

The Seafood Technology Bureau (STB) conducted a total of 147 inspections (routine, follow-up, and certification inspections). A total of 44 sanitation and Hazard Analysis Critical Control Point (HACCP) deficiencies were cited. The bi-annual water quality sampling for seafood dealer and processor facilities for March 2021 was completed with a total of 49 samples taken.

The STB staff conducted three foodborne illness investigations related to raw oyster consumption. Two cases involved oysters that were harvested from Texas and one case involved oysters that were harvested from Louisiana.

Gulf States Marine Fisheries Commission
Technical Coordinating Committee
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Emerging Issues Pertinent to Gulf of Mexico Fisheries

COVID-19 / CARES Act

The World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020. COVID-19 directly affected the United States (US) economy due to Stay at Home orders and the closing of all nonessential businesses. The US government acted quickly to assist the public when Congress passed the CARES Act and it was signed into law by President Trump onMarch 27,2020. The CARES Act was an over $2 trillion economic relief package that contained $300 million for the US Secretary of Commerce to provide to affected fishery participants. The Louisiana Department of Wildlife and Fisheries (LDWF) compiled a report showing losses in economic value by fishery and submitted to NOAA for approval. Louisiana is to receive a total of $14,785,244 in economic assistance for eligible fishery participants. The Gulf States Marine Fisheries Commission (GSMFC) will administer economic assistance to the eligible participants in LA through direct payments based on the approved LA Spending Plan.

LDWF developed an online application portal for its CARES ACT Program and contracted with South Central Planning and Development Commission (SPDC) for assistance with the application process. LDWF set its initial application period to open at 8am September 14th and set it to close on October 26th at 11:59 pm. During this time, 1335 application were received by LDWF. Due to the low turnout and a very active hurricane season, LDWF extended the application period until 11:59pm November 23rd. On November 14th, LDWF held an in person application event in Lake Charles to assist those in SW LA who were affected by Hurricanes Laura and Delta. Thirty four people showed up at the event and LDWF collected 21 applications. By the end of the application period on November 23rd, LDWF received 1695 applications. By the end of June 2021 the review process was complete and 1175 applicants received a total of $14,397,430.90.

Due to the ongoing adverse impacts of COVID-19 on March 29, 2021 the Secretary of Commerce announced an additional $255 million in fisheries assistance funding provided by the Consolidated Appropriations Act of 2021 (3. NOAA Fisheries 2021). The Consolidated Appropriations Act of 2021 states that funding will support activities previously authorized under Sec. 12005 of the Coronavirus Aid, Relief, and Economic Security Act (CARES Act). Louisiana's allocation of the $255 million made available to fishery participants totals $12,477,165.

LDWF made some minor adjustments to its previously approved 2020 spend plan and made some minor modifications to its current online application portal. LDWF again contracted with South Central Planning and Development Commission (SPDC) for assistance with the application process and translation services. LDWF opened the application period August 9 through August 29, 2021. LDWF is in the process of reviewing applications and should have a finalzed list of approved applicants to GSMFC before the end of October 2021.

Hurricane Ida Impacts

Huricane Ida made landfall at Port Fourchon on August 29, 2021 as a major, category 4 storm. Hurricane Ida had a widespread area of impact, from western Terrebonne Parish to the Louisiana/Mississippi state line. An infrastructure assessement for each of the commercial

fishery sectors has not been completed at this time. Losses within the shrimp, oyster and blue crab industries have been confirmed. Several processors suffered major to total losses of their facilities, while others received minor to moderate damage but a total loss of frozen product. Vessels have been reported on the opposite sides of levee systems, flipped in the marsh and bayous, and damaged. The alternative oyster culture industry took a major loss, while the traditional on bottom oyster reefs have encountered some muddy overbudern on reefs; clean up efforts have started to decrease mortality on the reefs.

LDWF has begun working with Louisiana Sea Grant to develop an economic damage assessment similar to what was completed after Hurricane Katrina, which will include both infrastructure and revenue losses of the commercial industry in the impacted areas. The assessment will utilize LDWF trip ticket and licensing data, geospatial wind and surge data, and information collected directly from those impacted.
LDWF's Fisheries Research Lab on Grand Isle survived the storm very well and sustained minor water damage. The island has been without power or water service since August 29. The lab is currently being utilized as a base of operations for the local authorities and the National Guard and is operating using generator power and regular fuel and water deliveries. While the lab serves this function, it will not be utilized by staff for LDWF operations. Contractually obligated sampling that normally occurs out of the lab is being conducted from several other locations.

Oyster Lease Moratorium
The Louisiana Wildlife and Fisheries Commission (LWFC) has approved a notice of intent for lifting the oyster lease moratorium. This public comment period has passed and the new regulations have been ratified. Currently, LDWF is coordinating with the Office of State Lands (OSL) and the Coastal Protection and Restoration Authority (CPRA) to work through Phase 0 oyster lease applications which is expected to conclude in the second quarter of 2022.

Activities Related to Artificial Reef Programs

Offshore
LDWF's Artificial Reef Program continues to assess and permit reef deployments related to offshore oil and gas structures. The Program has completed the reefing of a vessel in its Main Pass 300 Reef. There are 50 structures permitted for deployment as permanent artificial reefs, and one new reef site has been recently proposed. Permitting of an additional 29 structures is currently underway.

Multi-beam surveying of the Program's offshore reefs is ongoing (annually) and is available on the Program's website.

Inshore
LDWF's Artificial Reef Program did not deploy or enhance inshore artificial reefs, however the Program holds a permit to enhance the Finfish Reef in Calcasieu Lake and has applied to enhance the Bay Ronquille Reef near Grand Isle.

Nearshore
LDWF's Artificial Reef Program deployed the West Delta 23 and 24 artificial reefs near Venice in partnership with CCA. The reefs were constructed with a total of 753 tons of recycled concrete. The Program also has permits and agreements to create three more nearshore reef sites.

Monitoring
Through funds provided by the Louisiana Restoration Area Trustee Implementation Group, LDWF continued the monitoring of all completed inshore and nearshore artificial reef enhancement sites. This is part of a 5-year plan to assess the success of artificial reefs enhanced in an effort to mitigate for recreational use opportunities lost during the Deepwater Horizon Oil Spill. Monitoring efforts include the study of the aquatic organisms utilizing the reef enhancement sites via the use of gillnetting, rod and reel sampling, and benthic tray observations, as well as observations of recreational users. Together, those efforts are intended to provide insight into the overall biological health of the reef enhancement sites as well as insight into whether those sites are providing enhanced recreational opportunities to the public.

Activities Associated with the Gulf of Mexico Crab Fisheries

Policy and Regulations

During the 2021 Regular Session, Senate Bill 134 (SB134) was brought before legislation to ban nighttime shrimping in Lake Pontchartrain; this bill was drafted on behalf of the crab fishermen utilizing those state waters. SB134 was voluntarily deferred in the Senate Committee on Natural Resources and it was transistioned into a study resolution. Within the study resoltution, the crab task force and shrimp task force, with input from the Department, will study ways to minimize damage to crab traps in Lake Pontchartrain and report any recommendations to the Senate Committee on Natural Resources on or before February 4, 2022.

No additional changes to policy or regulation took place during the reporting period.

Derelict Crab Trap Program

The Louisiana Wildlife and Fisheries Commission (LWFC) adopted a Notice of Intent in August 2020 to establish four defined derelict crab trap cleanup areas during the 2021 harvest season. Within the four areas, the use of crab traps would be prohibited during the 14-day cleanup, or closure, period. These closure areas are to be held within the Pontchartrain Basin (x2), Terrebonne Basin, and Vermilion-Tech Basin. A scheduled volunteer event was planned to take place on the first Saturday of the Terrebonne Basin closure, but was canceled due to COVID-19.

The first Pontchartrain closure took place between February 1, 2021 – February 14, 2021 and a total of 2,162 derelict or abandoned crab traps were removed. The Terrebonne and Vermilion closures took place at the same time as the first Pontchatrain closure and a total of 107 and

113, respectively, crab traps were removed. The second Pontchatrain closure took place between February 22, 2021 – March 7, 2021 and a total of 2,781 traps were removed. All traps were removed by the Department and the Pontchartrain Conservancy, who partnered with the Department.

The Department decided to suspend the pilot program with the Pontchartrain Conservancy due to COVID-19. The pilot program was designed to improve the current derelict crab trap program and develop options that may be used as an alternative towards the current program. The focus within this is to develop a program that incentivizes the commercial blue crab industry to participate in removal of derelict crab traps, to increase the number of derelict or abandoned crab traps removed from state waters, and to reduce the overall cost of the current program. These program goals would reduce competition from traps that are not actively fished, or "ghost fishing", increase the resilience of the blue crab population by allowing more escapement for spawning, and assist the industry with sustainability by reducing bycatch.

Sustainability

The fourth surveillance audit and reassessment of the Louisiana blue crab commercial trap fishery against the Audubon Nature Institute's Gulf United for Lasting Fisheries Responsible Fisheries Management (Gulf-RFM) Standard v1.2 was scheduled to take place during the fall of 2020. This audit and reassessment was granted a 6-month extension in order to increase the Fiscal Year (FY) budget for the Crab Promotion and Marketing fund, which is used by the Louisiana Crab Task Force to promote and support their fishery. The surveillance audit and reassessment took place on May 19, 2021. The final report is estimated to be completed in July 2021.

The Louisiana Crab Task Force voted to have Global Trust take over the Marine Stewardship Council (MSC) assessments. Information for the third surveillance audit of the Louisiana blue crab commercial trap fishery against the MSC fisheries standards was gathered by Global Trust during the Gulf-RFM audit. The MSC final report is expected later in 2021.

Stock Assessments

No formal stock assessment was completed for the Louisiana blue crab stock in 2021. Blue crab indices of abundance and model estimates were developed to assist with the two sustainability certification audits. Model estimates indicated that the Louisiana blue crab is not overfished or experiencing overfishing.

Landings

All landings data presented in this section are preliminary and subject to change.

Blue crab landings from January – June in 2021 totaled 19.9 million pounds with a dockside value of approximately $42.6 million. Landings from this period in 2021 showed an increase of nearly 18 percent when compared to the five-year average (2016-2020), while the dockside value increased by approximately 55 percent. With the increase of landings and dockside value, the 2021 average price per pound was $2.15, which is $0.51 above the five-year average.

Blue Crab Biological Sampling

In the fall of 2020, the GSMFC awarded the Department with a grant from its IJ funding to sample commercial blue crab and collect data that will assist in characterizing the size and sex composition of commercially landed blue crab. Sampling began in January 2021, with each coastal study area (CSA) responsible for collecting data on 510 crab per two month period, or wave. There are a total of 5 CSAs, so an expected total of 2,550 blue crab are sampled every two months. Data collection is ongoing and will be reported in a later report.

Activities Related to Fisheries Dependent Data Collection

LA Creel

Through the LA Creel program, 4,770 recreational fishing trips, comprised of 12,673 individual anglers, were surveyed during 2021 Sample Weeks 1 – 26 (January 4, 2021 – July 4, 2021). Fifty-six different interviewers completed 791 of the 806 assignments as drawn during the sample period.

Fish kept by anglers and allowed to be viewed by interviewers are referred to as observation Type 1 fish. Fish in possession of the angler at the time of survey but not seen by the interviewer are classified as observation Type 2 fish. For the sample period as above, 32,383 Type 1's and 8,920 Type 2's, equalling 78 percent of all fish in possession of the angler at the time of survey were identified and counted by staff.

Seventy-nine species were represented among Type 1 fish, including some blue crab. Spotted Seatrout was the most commonly counted species with 14,251. Red Drum was second with 7,479 counted and Sheepshead was the third most common with 3,016 counted.

Certain species returned to the water or caught and used for bait are also recorded. Those species are:

1. Black Drum
2. Gray Snapper
3. Gray Triggerfish
4. Greater Amberjack
5. King Mackerel
6. Largemouth Bass
7. Red Drum
8. Red Snapper
9. Sheepshead
10. Southern Flounder
11. Spanish Mackerel
12. Spotted Seatrout

Fish thrown back because they were under the legal minimum length are coded as Type 3. Fish caught and used as bait during the trip are coded as Type 4. Fish thrown back or given away prior to interview for any reason not covered by codes 3 and 4, such as too big, not wanted, etc., are coded as Type 5. Discard data is collected as per the Department's contract with GSMFC.

During the same time period as provided above, staff recorded 20,655 Type 3's, 8 Type 4's, and 4,018 Type 5's.

To generate harvest estimates, angler effort must be determined. LA Creel uses two separate surveys to determine angler effort. One survey targets charter captains in which ten percent of the approximately 1,000 charter license holders and thirty percent of the approximately 140 charter license holders who also have a Recreational Offshore Landing Permit (ROLP) are drawn at random each sample week. The ROLP is a free permit required to possess tunas, billfish, swordfish, amberjacks, groupers, snappers, hinds, cobia, wahoo, and dolphinfish in Louisiana waters. The purpose of the ROLP is to increase the chances of drawing anglers who fish offshore for effort surveys. During a Red Snapper season (federal and/or state), one hundred percent of ROLP holding charter captains are drawn. Department staff attempt to contact drawn captains to ask about the number of charter trips taken during the sample week, how many paying customers were on each trip, and what basin the trip occurred in.

During 2021 Sample Weeks 1 – 26, a total of 2,146 captains were drawn, with replacement. Of those, a total of 1,481 captains (69%) completed the survey.

The other effort survey pertains to private anglers exclusively. Each sample week, not including weeks that fall within Red Snapper seasons, a total of 1,600 Louisiana recreational saltwater fishing license holders are drawn at random for participation in the effort survey. Twelve hundred of the 1,600 are derived by drawing 300 licensed anglers from each of LA Creel's four regions to generate landings estimates. A separate random selection of 400 is made from ROLP holders. During Red Snapper seasons, the number of private ROLP anglers drawn for the effort survey increases from 400 to 800. A service contracted by the Department is tasked with contacting drawn license holders to ask questions, such as basin fished in, number of trips taken, about any saltwater fishing trips they may have taken during the sample week.

During 2021 Sample Weeks 1 – 26, a total of 45,600 Louisiana recreational saltwater fishing license holders were drawn, with replacement. Of those, a total of 22,972 (50%) completed the survey. The estimated number of saltwater fishing trips taken during the time period was just over 992,000.

The iPad application used for data entry of dockside surveys was to undergo a rebuild in the spring of 2019, but was pushed back to the spring of 2020. The contractor hired to perform the rebuild finished their work as scheduled and the rebuild was released to field staff in the fall of

2020. However, there were several issues that affected performance and reliability. Although the app remains on field iPads, a new contract is being developed for the contractor to provide ongoing maintenance support so faults can be corrected and improvements made as needed. There is no timeline for contract execution.

Age and Growth

Since the new BIOFIN agreement covers recreational species only, LDWF's Age and Growth Lab in Baton Rouge relies on the National Oceanic and Atmospheric Administration's (NOAA) TIP sampling for commercial otoliths. The lab has processed recreational, commercial and independent otoliths during 2021. From January 1, 2021 through June 30, 2021, the lab has received 6,999 recreational marine fisheries otoliths and aged 5,631 of these otoliths. All otolith collection and ageing data has been transferred to GSMFC through the month of May. Staff are currently completing June and July otolith processing. The Age & Growth lab hired a manager and two biologist during this reporting period.

Otolith totals are as follows:

- Black Drum – 1208
- Cobia – 2
- Gray Snapper – 38
- Greater Amberjack – 7
- Gray Triggerfish – 2
- King Mackerel – 0
- Red Drum – 1166
- Red Snapper – 451
- Sheepshead – 1333
- Southern Flounder – 181
- Spotted Seatrout – 1934
- Striped Mullet – 65
- Tripletail - 1
- Vermilion Snapper – 45

Commercial Shrimp, Oyster, and Crab Seasons and Landings

Shrimp

The 2020 fall inshore shrimp season closed on January 24, 2021 in all remaining state inside waters except for the open waters of Breton and Chandeleur Sounds. Additionally, the portions of Louisiana territorial seas from Freshwater Bayou Canal eastward to Calliou Boca closed on January 24, 2021.

A portion of state territorial seas from Caillou Boca westward to the Atchafalaya River Ship Channel opened on March 26, 2021. The remaining portion of state territorial seas from the Atchafalaya River Ship Channel westward to Freshwater Bayou Canal opened on May 10, 2021.

The spring inshore shrimp season was set by the LWFC and opened statewide on May 24, 2021.

Shrimp landings (all species combined and heads on unless specified otherwise) between January – June 2021 totaled approximately 27.6 million pounds with a dockside value of $47.4 million. The 2021 shrimp landings during this period decreased by approximately 26 percent compared to the 5-year average, while the dockside value increased by nearly 9 percent. While overall numbers in 2021 were low compared to the five-year average, the shrimp average price per pound in this period was $1.72, which is $0.55 above the five-year average.

Louisiana brown shrimp landings during the time period mentioned above in 2021 were below the 5-year average by approximately 45 percent; the dockside value of brown shrimp was 12 percent below the five-year average. Although the total dockside value during this period was below the five-year average, the average price per pound for brown shrimp in 2021 was $1.18, or $0.44 above the five-year average. Brown shrimp landings were abut 2 million pounds above what was recorded in 2020, but still well below the average. Brown shrimp were negatively impacted in 2021 due to historical rainfall amounts throughout spring and continuing into the season; salinities and temperatures across coastal Louisiana were lower than normal because of the rainfall and high river levels which reduced suitable habitat.

White shrimp landings in 2021 did not show a significant difference from the five-year average. While landings between January – June of 2021 were 2 percent below the five-year average, the average white shrimp dockside value was 21 percent above the average. White shrimp average price per pound was over $2.00 for the first time compared to the reporting period.

Blue Crab

Described in the Activities Associated with the Gulf of Mexico Crab Fisheries section above.

Oyster

The table below summarizes the 2020-2021 Louisiana public oyster ground season. The goal was to reduce harvest stress on the resource, allowing for continued recovery from 2019 flooding, while continuing to use thresholds from the shell budget model.

2020-2021 LDWF Oyster Season Summary						
CSA	**Area**	**Opening**	**Closure**	**Season/Type**	**Days Open**	**Harvest* (sacks)**
1	**POSG East of Mississippi river and North of MRGO**	CLOSED				

	POSG East of Mississippi river and South of MRGO	CLOSED				
3	**Hackberry Bay**	16-Nov	16-Nov	1-day Seed harvest	1	525
		17-Nov	23-Nov	Market Oyster Harvest	5	100
	Little Lake, Barataria Bay	CLOSED				
5	**Deep Lake, Lake Chien, Lake Felicity and Lake Tambour**	CLOSED				
	Sister Lake, Lake Mechant	CLOSED				
	Bay Junop	16-Nov	16-Nov	1-day Seed harvest	1	4
		17-Nov	23-Nov	Market Oyster Harvest	5	0
6	**Vermilion Bay**	CLOSED				
7	**Calcasieu Lake**	30-Oct	30-Apr	East Cove: Market Oyster Harvest	131	46
		30-Oct	30-Apr	West Cove: Market Oyster Harvest	131	10

*Harvest numbers are reported through LDWF surveys conducted during oyster fishing activities. All public grounds were closed well before Hurricane Ida developed.

Activities Related to Fisheries Independent Sampling

Stock Assessments

LDWF completed an update stock assessment of Striped Mullet in November of 2020 that was presented to the LFWC for transmittal to the Louisiana Legislature in February 2021. This assessment uses a statistical catch-at-age model to estimate annual time-series of spawning stock biomass and fishing mortality rates. Time-series of fishery catches-at-age along with a relative abundance index developed from the LDWF fishery independent marine experimental gillnet survey are the primary model inputs. Based on results of this assessment, the Striped Mullet stock is currently not overfished or undergoing overfishing.

LDWF began a stock assessment of Red Drum in January 2021 that will be completed later in 2021. This assessment also uses a statistical catch-at-age model to estimate annual time-series of spawning stock biomass and fishing mortality rates. Time-series of fishery catches-at-age along with abundance indices developed from the LDWF fishery independent marine trammel net survey, the LDWF component of the SEAMAP nearshore bottom long line survey, and the historic NOAA Fisheries mark and recapture population estimates are the primary model inputs.

LDWF began an update assessment of spotted seatrout in May 2021 that will be presented to the LWFC in November 2021. This assessment also uses a statistical catch-at-age model to estimate annual time-series of spawning stock biomass and fishing mortality rates. Time-series of fishery catches-at-age along with relative abundance indices developed from the LDWF fishery independent marine experimental gillnet survey are the primary model inputs.

Fisheries Research Lab

LDWF's Fisheries Research Lab in Grand Isle is the base for the state's offshore fisheries independent monitoring and research projects. The lab also serves as a point of contact for the public, visiting researchers, and educational programs. Some current activities at the lab are summarized below:

Southeast Area Monitoring and Assessment Program (SEAMAP)

LDWF participated in three SEAMAP surveys: Shrimp/Groundfish, Vertical Line, and Bottom Longline during the January through June time period. If not for Hurricane Ida, LDWF would have also participated in Plankton sampling for SEAMAP, but we were unable. The summer Shrimp/Groundfish survey was completed over five days with environmental and biological data collected at 23 stations during the survey period. Fall Shrimp/Groundfish has yet to be completed for 2021. The Vertical Line survey sampled 80 sites on a mixture of platform, artificial reef, and natural bottom habitats from June through August. Bottom Longline runs from April through September and is split into spring, summer, and fall sampling periods. The spring and summer Bottom Longline sampling has yielded 59 stations sampled, but the fall sampling is still ongoing. Hurricane Ida has also impacted data entry and analysis and most of the data management for these surveys will be conducted during the late fall and winter. More data details will be available at that time.

Black Drum Life History Study

In winter and spring of 2021, the Fisheries Research Lab sampled 275 Black Drum (163 males and 112 females). Ovaries were taken from all 112 females and all have been histologically processed. Hurricane Ida has slowed our ability to enter and analyze the data. However, there will be fecundity samples to count because multiple hydrated females are present, unlike last year. In data collected January through March, the majority (60%) of Black Drum sampled were age 21-25. When analysis is completed, this data will determine if spawning stock biomass is an appropriate proxy for total egg production and will further inform managers for establishing regulations.

Sheepshead Life History Study

In 2021, LDWF biologists sampled 316 Sheepshead (159 males and 154 females) from March through May. All 154 females have been histologically processed and classified, but Hurricane Ida has delayed data entry. Ages have been entered into the database for all of March and range from 2-13 years. Qualitatively, Sheepshead look to be daily spawners that spawn for only two

months. When data analysis is complete, this data will determine if spawning stock biomass is an appropriate proxy for total egg production and will further inform managers for establishing regulations.

Southern Flounder Experimental Gear/Fyke Net Pilot Survey

Southern Flounder adults are not well represented in the current LDWF independent sampling. Gillnet and trammel net surveys have been sampling very low numbers of Southern Flounder and the trawl surveys have mainly caught juveniles. Because of this data gap, a new gear is currently being tested to potentially establish a new fisheries independent survey. A fyke net with two 8 foot (2.5m) wings and a 100 foot (30.5m) lead net with 1.5 inch (3.81cm) bar mesh is set perpendicular to the shoreline in order to capture flounder traveling parallel to the shore. Each site is randomly chosen from a group of pass/channel and marsh (backside of the barrier islands) sites. The start of the project was delayed to mid-November of 2020 due to a delay in Section 7 gear approval, but sampling began in November 2020 and continued through December 2020 and January of 2021. The gear testing was not very successful with only three Southern Flounder captured with the fyke net at a Grand Terre pass/channel site. This resulted in the reevaluation of the survey design. Initially the nets were to be soaked for a maximum of 24 hours with a check at the first 2 and 4 hours after the set. However, no flounder were caught during any of those soak durations. In late December it was decided to test a soak time of 48 hours which resulted in three Southern Flounder caught in the first attempt. Given these results, in January the soak times were expanded to 72 hours with a check at 24 and 48 hours. Despite weather making this problematic, 72 hour soaks were completed for multiple sites, but it was during neap tide which may have had an effect on flounder movement. The eastern barrier island sites were also problematic due to their remote locations which made them very time consuming and difficult to access. It was decided to replace the eastern Barataria Bay barrier island sites with more sites on the western barrier islands (Elmer's, Grand Isle, and Grand Terre Islands). We have learned quite a bit from our initial attempts to utilize this experimental gear and will continue to tweak the survey design to improve our sampling numbers. Hurricane Ida has delayed our sampling again in 2021 but we look forward to using fyke nets that have been slightly modified from our old design.

Artificial Reef Monitoring for Sportfish

In order to enhance the monitoring of sportfish species on artificial reef structures, LDWF biologists from the Grand Isle Fisheries Research Lab are using a combination of vertical line sampling, video sampling, and diver surveys. Approximately ten percent of the artificial reef structures in the LDWF Offshore Artificial Reef Program were randomly selected and assigned to the 2021 vertical line survey. A total of 30 artificial reef structures were sampled using both hooked vertical line and camera gear and 4 structures were sampled by divers with camera recordings. Vertical line catch data entry and video analysis has been delayed due to Hurricane Ida.

Shrimp Sampling

LDWF conducts fisheries independent sampling for shrimp year-round statewide using three trawl sizes: 6-foot, 16-foot, and 20-foot. The 6-foot trawl samples gather data in the interior marshes of Louisiana and are used to set the opening and closing dates for the spring inshore shrimp season. These samples are typically taken throughout April and again at the end of June and beginning of July, depending on environmental conditions. From January – June 2021, a total of 288 6-foot trawl samples were conducted. A small portion of these samples were collected as a component of a monitoring agreement with another state agency and not for monitoring the resource for a closure.

The 16-foot trawl sampling data are used to constantly monitor the state shrimp resource, along with other species of interest, and set the opening date for the fall inshore shrimp season. During January – June 2021, a total of 908 16-foot trawl samples were conducted.

The 20-foot trawl sampling data are used to monitor shrimp resources in state offshore waters. A total of 125 20-foot trawl samples were conducted during January – June 2021. Data collected in the 20-foot trawl samples were used to open the portions of state offshore waters described earlier. These samples are primarily taken during the winter and spring months.

Crab Sampling

Fisheries independent sampling data for blue crab is collected with 16-foot trawls. These data are used to calculate juvenile and adult blue crab indices of abundance for the blue crab stock assessment.

Oyster Sampling

LDWF conducts fisheries independent sampling for oysters year-round, statewide, using two gear types (24-inch hand dredge and square-meter frame: m2) within the public oyster areas, and analyzes the data collected to determine overall health of the oyster resource throughout the year. Dredge sampling occurred monthly throughout the year, except the month of July, on 72 sampling stations located within the public oyster areas from the Louisiana/Mississippi state line to the western shore of Calcasieu Lake. In addition, six dredge stations in Sabine Lake were sampled quarterly during the reporting period. Two replicates were taken per station to monitor size frequency, presence and/or absence of resource, and mortality. A total of 888 dredge samples were collected between January 1 and June 30, 2021.

LDWF biologists performed quantitative evaluations using SCUBA equipment to collect oyster samples from within a square-meter frame as part of LDWF Annual Oyster Stock Assessment, and as part of the System-Wide Assessment and Monitoring Program (SWAMP). Annual stock assessment samples are taken in July of each year, at each station; five replicate square-meter samples are collected and data combined to produce average density of spat, seed, and sack oysters per meter. Oyster density was multiplied by the associated reef acreage to obtain an estimate of total oyster population size. There are currently 102 square-meter sites, resulting in 510 samples being collected.

Sabine Lake is closed to oyster harvest due to Act 159 (RS2018). Dredge sampling is conducted quarterly and square-meter sampling is conducted every other year, with the next square-meter sampling scheduled for July 2021. Additional sampling may occur as needed to monitor for possible mortality events.

LDWF conducts additional square-meter oyster SWAMP sampling in the spring, fall, and in July every year (CSA 3 only) under an agreement with the Louisiana Coastal Protection and Restoration Authority (CPRA). The SWAMP sampling was conducted in the Lake Pontchartrain and Barataria Basins in May 2021. In the Pontchartrain basin, 42 sites, with 3 replicates each were sampled. In the Barataria Basin, sampling consisted of 34 sites—9 regular square-meter sites and 25 additional sites located within private oyster leases. This is in accordance with CPRA agreement to better characterize the basin. In total 228 samples were collected in May of 2021.

LDWF uses oyster stock assessment information to make recommendations regarding setting oyster seasons to the Louisiana Wildlife and Fisheries Commission. Seasons can open as early as mid-September and can run through the end of April of the following year. Seasons may be closed or delayed if biological concerns or enforcement problems are encountered.

Finfish Sampling

LDWF conducts biological monitoring for finfish statewide in the coastal, nearshore, and offshore areas of Louisiana. During fiscal year 2020-21, the fisheries independent finfish sampling program collected 948 gillnet samples, 1,264 seine samples, and 264 trammel net samples for a 98 percent overall completion rate statewide. Electro-fishing samples (144 total) are being conducted within some Louisiana estuarine environments to provide fisheries data to CPRA. .

Other State Activities

Finfish Seasons and Regulations

Louisiana waters opened to the commercial harvest of Large and Small Coastal Sharks on January 1, 2021, concurrent with an opening in federal waters.

Louisiana waters closed to the recreational harvest of Gray Triggerfish on January 1, 2021, concurrent with a closure in federal waters.

Louisiana waters opened to the commercial harvest of Spotted Seatrout on January 2, 2021.

Louisiana waters closed to the commercial harvest of Striped Mullet with strike nets on January 18, 2021.

Louisiana waters closed to the recreational harvest of Scamp and Black, Red, Yellowfin, and

Yellowmouth Groupers from February 1, 2021 through March 31, 2021 in waters seaward of 120 feet, concurrent with a seasonal closure in federal waters.

Louisiana waters opened to the recreational harvest of Gray Triggerfish on March 1, 2021, concurrent with an opening in federal waters.

Louisiana waters closed to the commercial harvest of Greater Amberjack from March 1, 2021 through May 31, 2021 for an annual seasonal closure.

Louisiana waters closed to the commercial harvest of Aggregated Large Coastal Sharks and Hammerhead Sharks on March 10, 2021, concurrent with a closure in federal waters.

Louisiana waters closed to the recreational and commercial possession of all sharks from April 1, 2021 through June 30, 2021 for an annual seasonal closure.

Louisiana waters opened to the commercial harvest of bait Gulf Menhaden on April 1, 2021.

Louisiana waters opened to the commercial harvest of Gulf Menhaden for reduction on April 19, 2021.

Louisiana waters opened to the recreational harvest of Greater Amberjack from May 1, 2021 through May 31, 2021, concurrent with an opening in federal waters.

Louisiana and Federal waters off Louisiana opened to the recreational harvest of red snapper on May 28, 2021, during weekends only (Friday, Saturday, and Sunday including the Mondays of Memorial and Labor Day).

Louisiana waters opened to the recreational harvest of Gag Grouper on June 1, 2021, concurrent with an opening in federal waters.

Louisiana waters closed to the recreational and commercial harvest of Gray Triggerfish from June 1, 2021 through July 31, 2021, concurrent with a closure in federal waters.

Louisiana waters closed to the recreational harvest of Greater Amberjack from June 1, 2021 through July 31, 2021, concurrent with a closure in federal waters.

Louisiana waters reopened to the commercial harvest of Greater Amberjack on June 1, 2021, concurrent with a reopening in federal waters.

Marine Mammal and Sea Turtle Monitoring

The marine mammal stranding program and the sea turtle stranding program are administered and coordinated directly by NOAA in Louisiana.

Michael C. Voisin Oyster Hatchery

The Michael C. Voisin Oyster Hatchery located on Grand Isle, Louisiana, is operated through a collaborative effort between LDWF and Louisiana Sea Grant (LSG). LSG assists with facility operations, provides technical guidance, manages the LSG Breeding Program, and supports the oyster industry through extension, outreach, and research projects. LDWF focuses on the production of diploid and triploid seed and larvae for state restoration projects, as well as commercial sales to support the industry.

Spring 2021 Season

The Spring 2021 hatchery production focused on producing diploid and triploid pediveligers and seed for LDWF sales. By July 2021, there were no diploid pediveligers and approximately 41,000,000 triploid pediveligers sold to local oyster farmers for LDWF sales. There were also 19,530,208 diploid pediveligers and 10,347,850 triploid pediveligers set on 250 micron microcultch to produce seed for LDWF sales. Of these larvae set, a total of 195,532 diploid seed and 27,533 triploid seed were sold to oyster farmers for LDWF sales.
Due to staffing shortages with COVID-19 restrictions the hatchery could not run at full capacity for a portion of the season. Therefore, less larvae were produced for sales and restoration than desired. There was also an unknown issue with the tetraploids and egg/water quality that prevented the hatchery from supplying a higher abundance of triploid pediveligers larvae. On top of these restrictions and limitations, the Michael C. Voisin Oyster Hatchery had a rogue storm come through on April 13, 2021 and damage equipment and resources at the hatchery.

In addition to oyster larvae, the Michael C. Voisin Oyster Hatchery also produces all of its own marine microalgae to feed to the oyster larvae. In the Spring 2021 season, the microalgae continued to experience water quality issues. Different culprits were looked into such as: water quality (i.e. vibrio, bacteria, toxins, and heavy metals), filtration issues, and contamination. It was also determined that our LED lighting may not be optimal for the growth of our marine microalgae.

Spat on Shell Projects

The Louisiana Department of Wildlife and Fisheries Michael C. Voisin Oyster Hatchery produces diploid oyster larvae for setting on shell, which is then referred to as spat-on-shell and is used for State oyster restoration projects. To prepare for setting on shell, mesh bags that are three feet long are filled with recycled oyster shell and are called shellbags. Recycled shell is obtained through a collaboration with the Coalition to Restore Coastal Louisiana's Oyster Shell Recycling Program.

In the Spring 2021 season there were two spat-on-shell deployments, one of which included a spat-tech trial where larvae were set at two different stocking densities. By July 2021 there were 11,348,000 pediveliger larvae set on spat-on-shell for restoration efforts. This resulted in a total of 3,635,082 estimated spat deployed on coastal Louisana oyster reefs. In the Spat Tech trial, larvae were set on shell at a stocking density of 250,000 spat per cubic yard and 50,000 spat per cubic yard per Spat Tech protocols. The normal stocking density used at the hatchery is approximately 118,000 spat per cubic yard to get 20 spat set per shell with a 20% setting success. 2,740,000 pediveliger larvae were set in the 250K trial and 548,000 pediveliger larvae were set in the 50K trial on May 7, 2021. After four days, the spat-on-shell was loaded into trucks and transported to Rigolets Marina and deployed on the West Karako Artificial Reef by Marine on May, 11, 2021. Approximately 210 shellbags were deployed on the reef with an estimated 203,764 spat-on-shell deployed onto the reef. Of this total, 175,813 spat were deployed from the 250K trial resulting in a 6.5% setting success and 27,951 spat were deployed from the 50K trial resulting in a 5.1% setting success. A second deployment occurred on June 22, 2021 to Independence Island. A total of 8,000,000 pediveliger larvae were set on approximately 440 shellbags on June 17, 2021. At deployment on June 22, 2021, there were an estimated 3,431,318 spat deployed on Independence Island. This resulted in a setting success of 42.89%. Marine will then conduct assessments on these deployments for Month 1, 6, and 18 to assess the survival success.

Boating and Non-Boating Access Projects

LDWF has several new and ongoing boating and fishing access projects, which are funded through the Sport Fish Restoration Program and administered by local entities. LDWF accepts project proposals on an annual basis and evaluates them based on ranking criteria and available funding. Current projects include:

- St. Tammany Fishing Pier – construction phase
- New Iberia Boat Slips Boating Infrastructure Grant Program – construction phase
- City of New Iberia CVA Sanitation Facility – design phase
- Indian Creek Recreation Area Fishing Pier – construction has been completed
- City of New Iberia Civic Center Marina Phase I – construction phase
- Marina Del Ray Renovations – permitting phase
- City of New Iberia Civic Center Marina Phase II – permitting phase
- Town of Leonville Boat Launch Improvements – design phase
- Town of Madisonville Boat Launch Improvements – construction phase
- Bucktown Harbor Marina and Dock Renovation – permitting phase

Additional boating and fishing access projects were recently approved by the Louisiana Trustee Implementation Group for funding from the *Deepwater Horizon* oil spill and are currently being designed and implemented.

Damage to existing and ongoing projects because of Hurricane Ida are unknown at this time; however, damage assessments will be conducted in the coming weeks.

Seafood Industry Professionalism

LDWF seeks to give the state's seafood industry access and training to the latest trends, requirements, and technology in their profession, as expert training will yield higher quality products and give the seafood community a competitive advantage in the marketplace. Since the launch of Louisiana Fisheries Forward: Advancing Our Seafood Industry, this one-of-a-kind professionalism program for Louisiana's commercial fishing industry has received inquiry, acknowledgement, and recognition throughout many facets of local, regional, national and global fishing industries.

The Louisiana Fisheries Forward (LFF) contract was extended for one year beginning January 2021. During this contract period, an educational alligator industry initiative continued to be developed. To date the alligator initiative has included an industry overview report and a study on the best management practices handling wild alligator meat along with corresponding fact sheets. Additionally, LFF released a report characterizing the black drum and sheepshead fisheries in Louisiana.

In the 2nd quarter of 2021, the Louisiana Fisheries Forward team continued to focus on the freshwater commercial fishing industry by holding an educational "Road Show". The event consisted of tours of local fish houses, docks, and processors in the Jonesville, LA area. Along with the tours, a town hall style meeting was held where LDWF and LFF staff members met with members of the freshwater commercial fishing sector.

Aquatic Plant Control

Invasive aquatic vegetation continues to threaten access and recreational activities throughout Louisiana. Spring surveys conducted from April - May 2021 revealed an estimated 216,196 acres of nuisance aquatic plant coverage, mostly composed of water hyacinth (60,207 acres) and giant salvinia (37,367 acres). Spring surveys are conducted at the beginning of the growing season and usually reflect slightly lower coverage than fall surveys conducted at the end of the growing season. From January 1, 2021 through June 30, 2021, LDWF applied EPA-approved herbicides to 10,996 acres of nuisance vegetation across the state. The majority of plant control efforts focused on giant salvinia and water hyacinth, with 4,457 and 4,168 acres treated, respectively.

Winter temperatures and isolated flood events have the potential to be major factors in determining the severity of aquatic vegetation impacts, especially giant salvinia, in Louisiana. A significant freeze event in February 2021, for the duration of several days, provided excellent control of aquatic vegetation throughout the state. Impacts from this event lasted throughout the spring and into the early summer in many parts of the state. Vegetation assessments will be made in the fall, and late-season herbicide applications will be scheduled accordingly.

Giant salvinia weevils continue to provide excellent control of the exotic weed throughout south Louisiana. Established populations of the weevil are present throughout coastal Louisiana, and have significantly reduced the need for herbicide applications to giant salvinia in those areas. Established populations have also been found this year in waterbodies where the weevils had previously been unable to survive. Iatt Lake, Black-Clear Lake, and the Larto-Saline Complex have all benefited from what appears to be established, surviving weevil populations. The presence of high weevil numbers in these lakes is resulting in thinner mats, less biomass, and less overall coverage of giant salvinia in some cases.

Gulf States Marine Fisheries Commission
72nd Annual Fall Meeting
Technical Coordinating Committee
Wednesday, 20 October 2021
Virtual Meeting

1. Emerging Issues Pertinent to Gulf of Mexico Fisheries.

Regulatory Proposals

Statewide Oyster Fishery Proclamation

Sought adoption of proposed changes to the Statewide Oyster Fishery Proclamation regarding the temporary closure of several restoration sites in Galveston Bay and Matagorda Bay for two harvest seasons in order to conduct oyster habitat restoration activities and allow oysters to repopulate these areas and reach market size (presented during the August Commission Meeting).

Coastal Thermal Refuge Area Closures

Sought permission to publish proposed changes to rules on freeze event closures in the Texas Register for public comment. The proposed amendments would:

1. Modify the definition of an "affected area";
2. Change the meteorological conditions that define a freeze to better frame the event in terms of lethal water temperatures;
3. Establish meteorological criteria for re-opening "affected areas" to fishing following a freeze event.

Digital Licensing and Tagging Requirements

Sought permission to publish proposed rules governing digital licenses and tagging. The amendments would function in conjunction with each other to implement a digital version of the Super Combination Hunting and "All-Water" Fishing License packages, including the Senior Super Combination License package as well as allowing for Lifetime Super Combination License holders to obtain digital tags for their lifetime licenses.

Also, based on results of the spring gill net sampling, the emergency action changing bag and size limits of Spotted Seatrout in the Upper and Lower Laguna Madre was recently extended by the TPWD Executive Director for an additional 60 days, expiring on September 29, 2021.

Oyster Updates

Commercial Oyster Mariculture (COM) Update

In 2019, the 86th Texas Legislature authorized the Texas Parks and Wildlife Commission (TPWC) to create a Texas Oyster Mariculture Program. The TPWC adopted rules in May 2020, and the department continued work to develop the permitting system and guidelines to be able to accept mariculture applications in the fall of 2020. Significant program developments include the following:

- Working with Texas Sea Grant to provide public trainings on the oyster mariculture permitting process. Four trainings have been given so far, and four more will be given by the end of the year.
- Working with Texas Sea Grant to develop an online permitting flowchart that will be available on Sea Grant's website to help the public navigate the permitting process.
- Refinement of program processes, procedures, guidance documents, application forms and online resources including an online permitting portal that will go live later this year.
- Continued coordination with other state and federal agencies regarding required permits for various aspects of the program, specifically regarding changes in response to the renewal of the NWP 48 General Conditions.
- Refined biosecurity protocols for the importation of out-of-state oyster seed as well as production of oysters at in-state hatcheries to protect wild oyster genetics.
- Development of an oyster hatchery permitting and oversight process
- Refining the standardized permit application and natural resource survey protocol to ensure no negative impacts to natural resources.
- Coordinating with the General Land Office to host GIS shapefiles as web services for creation of an online Spatial Planning Tool that allows for the visualization of the user conflicts and natural resources around the proposed site.

The first two applications were received in January 2021, one for an 8-acre farm in Copano Bay, and the other for a 10-acre farm in East Galveston Bay. The third application was received for a 5-acre farm in Tres Palacios Bay on 8/31/2021. The first final Oyster Mariculture Permit in Texas was issued for the 8-acre farm in Copano Bay on 7/26/2021. Additionally, coastal fisheries staff are in the pre-application consultation phase with ten other prospective applicants.

Oyster Shell Recovery

HB51 (85th Legislative Session, 2017) included a requirement that dealers purchasing oysters harvested from Texas bay systems return 30%, by volume, of the total quantity of oysters harvested during the previous license year. In lieu of returning this cultch back to public oyster reefs, dealers can pay the department a sack fee that will allow the department to return an equivalent amount to public reefs. The current amount of this fee per sack is $1.32 (has not been increased). Dealers are sent monthly invoices and balance sheets (based on monthly landings reported in Trip Tickets) by email and they follow up with payments or arrange a cultch plant to satisfy their requirements.

The license year 2021 landings were 861,939 sacks (110 lbs/sack) of oysters reported to the Texas Commercial Landings Program (Sep 2020 - Aug 2021). In 2021, dealers placed 16,150 cubic yards of cultch, making up for some of what was owed in the LY2020, in which cultch plants were delayed by covid. As of Aug 2021, 3,059,794 sacks have been harvested since the start of this shell recovery program (LY18). The program in total, since 2018, has generated $967,646 in fees (to be used for TPWD cultch plants) and 35,665.9 cubic yards of cultch have been placed in the bays by oyster dealers (Tables 1 and 2). This accounts for over 91% of the overall required fees/cultch, with the 9% of the pending fees and cultch mostly from what was owed from LY21. Overall, out of the 91% accounted for thus far, 67% were from dealer cultch plants and 24% were fee payments to the department. The current balance to date (Sept 2021), is either 5,341.6 cu yds cultch or $406,140 in fee payments. Dealers can choose one or the other (or both). Having two forms of currency is difficult to show clearly, so the last 2 columns provide the total paid if both cultch and fees were added together and then represented separately as one or the other.

Table 1. Summary of Oyster Shell Recovery program (License years 2018-2021)

				Final Disposition			Total paid if cultch and fee added	
LY (Sep-Aug)	**Sacks Harvested**	**Cultch Due (cu yds)**	**Fee in lieu of cultch ($)**	**Cultch (cu yds)**	**Fee ($)**	**% accounted for**	**cultch**	**fee**
2018	564,787	9,805.3	$745,519	6,590.6	$243,879	99.9		
2019	754,565	13,100.0	$996,026	9,705.3	$289,469	103.1		
2020	878,503	15,251.7	$1,159,624	3,220.0	$248,369	42.5		
2021	861,939	14,964.1	$1,137,759	16,150.0	$185,928	124.3		
Total	**3,059,794**	**53,121.1**	**$4,038,928**	**35,665.9**	**$967,646**	**91.1**	**48,392.6**	**$3,679,413**
Balance (as of 9/23/21)		**5,341.6**	**$406,140**	**67.1%**	**24.0%**			

Fees were accounted for in the years that the funds were due, and cultch plants were possibly accounted for in subsequent LY totals, so % accounted for may be more (or less) than what was due that year (ex. 2020 was low due to delays in cultch plants due to COVID).

Table 2. Total Dealer-Placed Cultch per Bay System per year.

Cubic Yards of Cultch

Year	Galveston Bay	Matagorda Bay
2018	1,985.2	4,605.3
2019	7,413.3	2,292.0
2020	3,219.9	
2021	14,674.2	1,476.0
All years	**27,292.6**	**8,373.3**

*2021 data as of 9-15-2021

Texas Oyster Landings

Public season oyster landings in LY2021 slightly surpassed the previous 2020 season, with 761,605 sacks landed in 2021 vs 737,560 sacks landed in 2020. Both years had a greater overall harvest than the previous 4 years. Landings during the 2020 season slowed in April due to covid, while the 2021 season had a brief pause due to the freeze in February 2021 (Figure 1), as evident from flatter parts of the cumulative curve. It is apparent that some of the trend of increasing harvest over the last 6 years is due to an increasing number of vessels actively oyster fishing (Figure 2). While vessel licenses continue to decrease, the proportion of vessels actually using (or transferring) their license has increased. Also, the proportion of non-resident licenses has also increased during this same period, as we have had more out-of-state vessels joining our oyster fleet. In LY2021 there were 480 resident and 66 non-resident oyster vessel licenses.

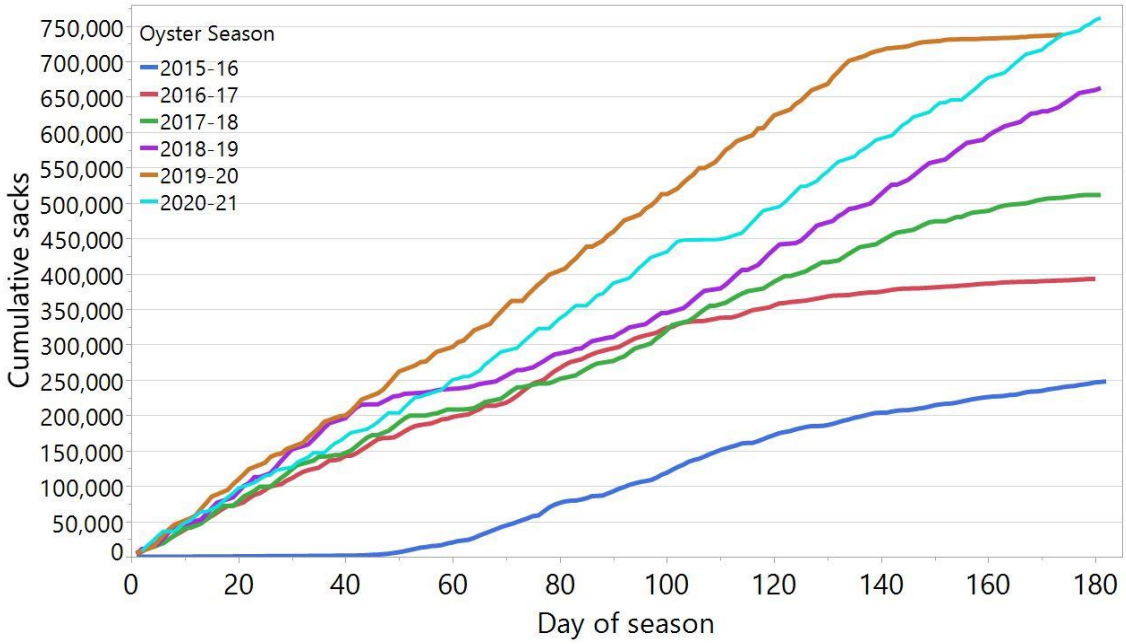

Figure 1. Cumulative number of sacks collected by the Texas oyster industry during the public oyster season (Nov-Apr) of the last 6 years of the public season.

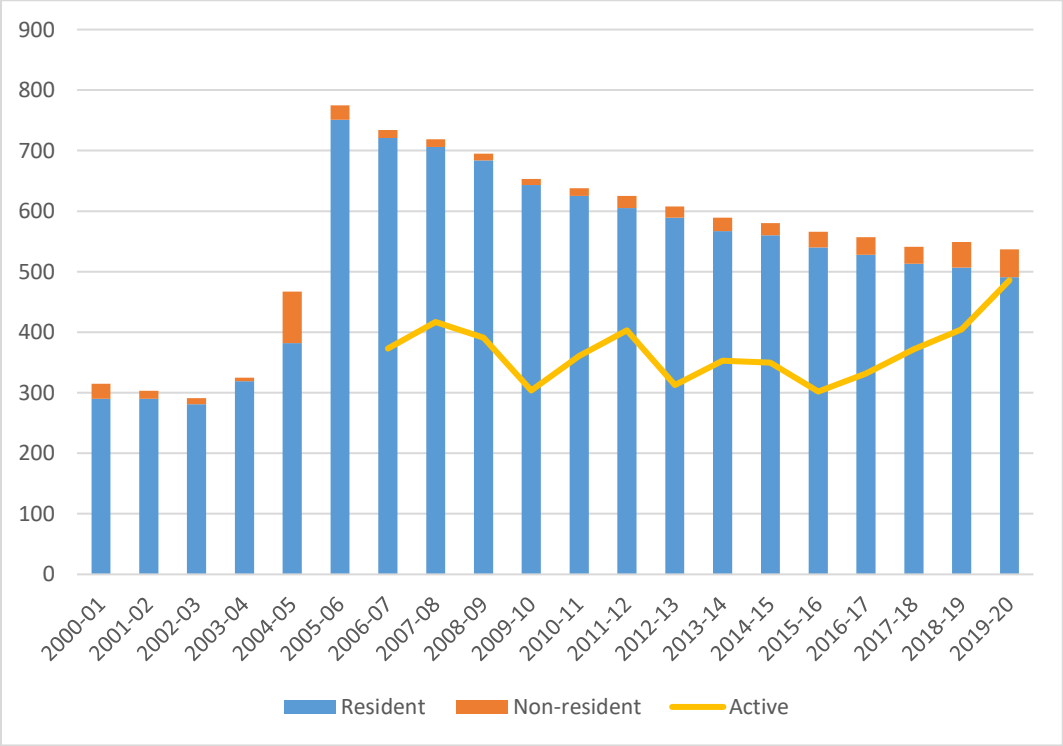

Figure 2. Resident and non-resident commercial oyster boat licenses purchased for the license years 1991-2020 and total number of vessels reporting landings during the public oyster season 2006-07 through 2019-20. [2021 LY – 480 resident; 66 non-resident]

Southern Flounder

In September of 2020, the flounder size limit was increased from 14 to 15 inches. In LY22 (as of September 1, 2021), TPWD has also made an adjustment to the flounder season and bag limit. From November 1 to December 15, there will be NO commercial or recreational take of flounder allowed. Previously, November was hook and line only (no gigs) and 2 fish instead of 5, with gigging allowed the first 2 weeks of December, but only 2 fish bag limit. These new regulations were put in place to allow for greater escapement of spawning fish into the gulf during their fall run.

2. Activities Related to Artificial Reef Programs.

All travel and non-essential meetings and field work has been placed on hold due to COVID-19.

The new year brought the retirement of J. Dale Shively. Dale had functioned as the program coordinator for quite some time and was a driving force behind elevating the Texas Artificial Reef program to its current level.

Rigs-to-Reefs

- Five Material Donation Agreements (MDA) were signed between the Artificial Reef Program (ARP) and Freeport McMoRan Oil & Gas for the deployment of five 8-pile platforms. Four of the platform jackets will be deployed at the HI-A-555 reef site. The fifth platform will be removed from EC-330 and towed to the HI-A-330 reef site. Each structure's donation agreement was finalized at $300,000.
- The 8-pile platform PN-956 B was deployed and surveyed on August 23, 2021. The platform donation between Williams and the ARP was for a $230,000 donation amount. The platform jacket was towed and deployed at the PN-A-42 reef site.

Ships-to-Reefs / Nearshore Reefs

- TPWD staff inspected 4 vessels that had been donated to the Friends of the Rio Grande Valley (RGV) Reef. This non-profit group is active in sourcing materials for deployment into the RGV nearshore reef site. All deployments were completed without any funding from, or liability on, TPWD.

Nearshore Reefs

- Laredo Construction LLC, in partnership with Atlantis Marine Habitats, was awarded the reefing contract for Big Man's, Kate's, and Sabine Nearshore Reefs. The contract will place 1,150 pyramids and 255 low relief plates at the reefs with a total cost of $2.7m. Most of the funding is coming from hurricane mitigation funds, with an additional $559,000 from the CCA. Unfortunately, Laredo experienced delays due to the winter storm that hit the Houston/Galveston metroplex in February. A 6-month no-cost extension was granted Laredo Construction, LLC. All materials will be constructed and deployed by February 2022. In June, ARP staff visited the Laredo work site for a material inspection. By August 2021, Laredo had constructed 463 pyramids and close to 100 low-relief reef plates.

- ARP staff received the three reauthorization permits from the USACOE: GA-220 - Kate's Reef; GA-220 - Big Man's Reef; and HI-20 - Sabine Nearshore. Each of these reef sites is part of the Laredo contract referenced above to receive roughly 250 reef plates and 1100 pyramids between the three locations.

Grants / Administration

- The Artificial Reef Program received the renewed Regional General Permit (RGP) from the US Army Corps of Engineers. This permit authorizes TPWD to undertake construction, maintenance, and repairs of artificial reefs structures. The new RGP will expire August 2026.
- The Artificial Reef Program was awarded funding for a project under the Texas Coastal Management Program Grant Cycle 26. This funding will allow for the deployment of 100 pyramids and 100 low-relief reef plates at the Sabine Nearshore Reef Site (HI-20). So far, no work has begun, but funding will be available beginning October 2021. The ARP anticipates the deployment of new nearshore materials in the Sabine nearshore reef site in Spring 2022.
- The GLO Asset Removal team and the ARP finalized the plan for the removal of the old Queen Isabella Causeway off Port Isabel/South Padre Island. The GLO has ownership of the bridge and it must be removed at some point soon. Estimates show that it may require $10-12m for removal (and reefing). A contract between the GLO and the ARP will allow for the ARP to oversee and carry out the required archeology survey for a new reef site. The contracted vendor, SEARCH, Inc., has received the antiquities permit from the Texas Historical Commission and field work and scanning can begin before Winter 2021.

Publication/Presentation

- Shipley, JB. (2021). 25 years of monitoring Texas artificial reefs. Texas Chapter of the American Fisheries Society. Feb. 2021, Presentation.

3. Activities Associated with the Gulf of Mexico Crab Fisheries.

Fishery Independent Data Trends

Based on TPWD fishery independent catch rates, coastwide relative abundance of blue crabs has shown significant declines since the 1980's. This trend is generally consistent in all Texas bays. While these trends have largely stabilized since the early 2010's, and gill net surveys suggest increased catch rates of adult blue crabs in recent years, bag seine and bay trawl catch-rates suggest that juvenile abundance continues to remain low (as low as 21% of the average 1980's catch-rate in the bay trawl surveys; Figure 3). Further analysis of this data suggests that juvenile mortality is increasing and thus the population is not seeing an overall increase in abundance.

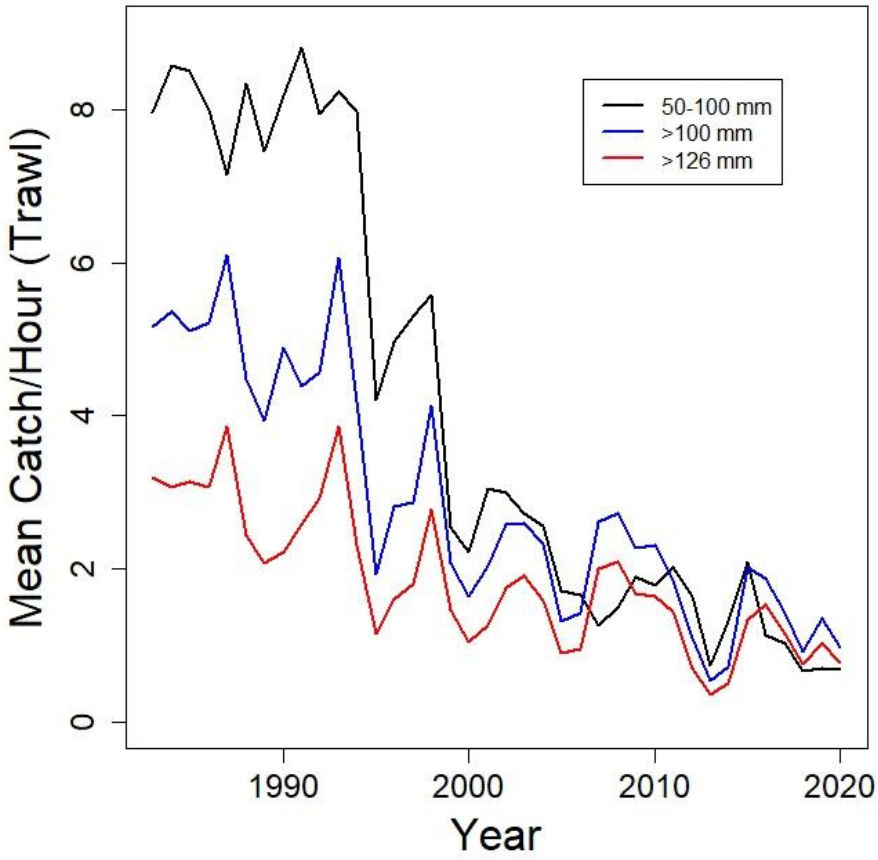

Figure 3. Fishery independent bay trawl catch rate collected by Texas Parks and Wildlife Department. The data includes coastwide catch rates from each major bay along the Texas coast. Note that samples were not collected for some bay systems in April and May of 2020 due to COVID restriction.

Regulatory Proposals

Proposed changes to crab regulations were passed and began Sept 1, 2021
Aransas Bay Crab Fishing

- Allows recreational use only of up to three crab traps in areas of Aransas County
- Securely tethered to a fixed object (dock, pier, or bulkhead), no open-water traps

4. Activities Related to Fisheries Dependent Data Collection.

Fishery-dependent collection of otoliths for the Gulf States Biosampling program

We are collecting otoliths from multiple species in conjunction with the GSMFC biosampling program. Otoliths are being collected from recreational anglers and aged via independent contractors paid by GSMFC. To date, the following samples have been processed at our facility:

Table 3. Summary of otoliths collected from recreational species at boat ramps for Gulf States Biosampling program.

Common Name	Scientific Name	Processed	Requested
Gray Snapper	*Lutjanus griseus*	22	75
Vermillion Snapper	*Rhomboplites aurorubens*	97	170
Red Snapper	*Lutjanus campechanus*	105	400
Triggerfish	*Balistes capriscus*	0	50
King Mackerel	*Scomberomorus cavalla*	1	300
Sheepshead	*Archosargus probatocephalus*	137	70
Southern Flounder	*Paralichthys lethostigma*	189	100
Black Drum	*Pogonias cromis*	487	340
Red Drum	*Sciaenops ocellatus*	1091	750
Spotted Seatrout	*Cynoscion nebulosus*	1907	1500

iSnapper – mobile reporting app

In addition to the TPWD creel program, the iSnapper app continued to collect data for the 2021 calendar year. Preliminary Red Snapper harvest estimates (based only on *iSnapper*) from the start of the federal season (June 1) thru the end of August resulted in an estimated 21,348 angler-trips, with an average of 1.8 fish per angler. This is in line with previous years estimates (~1.9 Red Snapper/trip). Interestingly, the average length and weight per fish in federal waters has consistently increased for the last 5 years (Figures 4 and 5). Final abundance estimates will be completed at the end of the year.

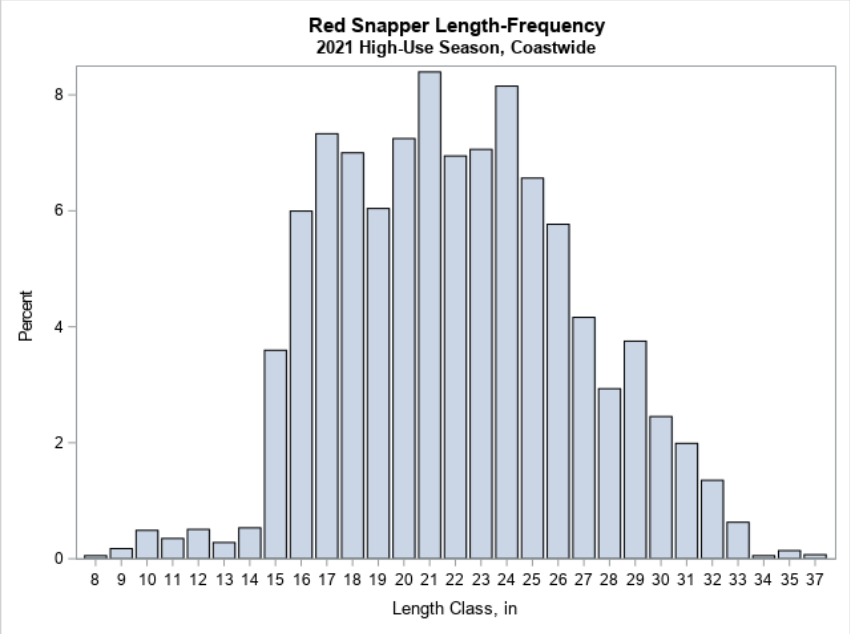

Figure 4. Frequency distribution of Red Snapper total lengths measured from 2021 TPWD creel surveys.

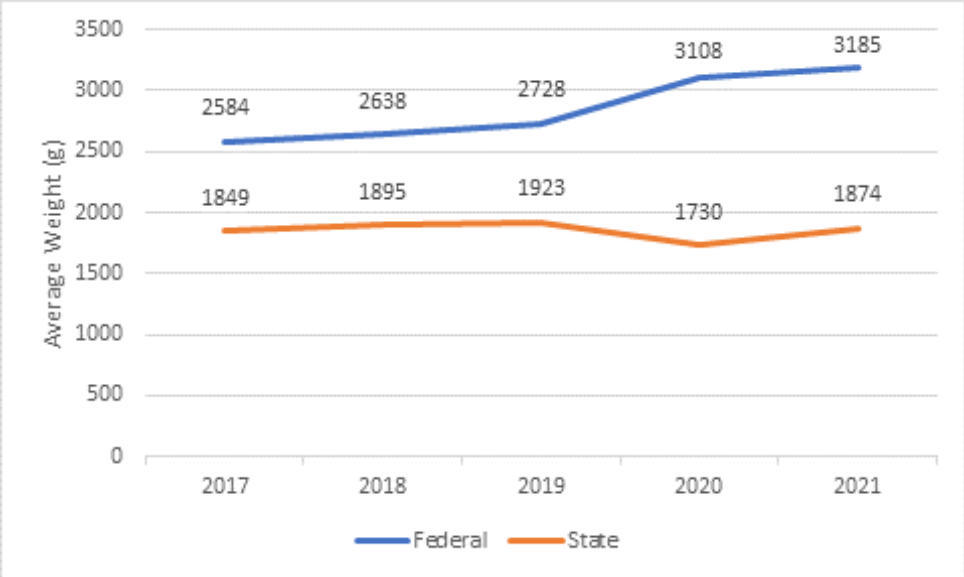

Figure 5. Average weight of fish measured (based on TL-WT relationship) from TPWD creels (2017-2021). Means not weighted to account for fish not actually measured.

5. Activities Related to Fisheries-Independent Sampling.

SEAMAP

Bottom longline sampling

This past March we were able to install the new longline winch on our R/V Brazos Santiago, which will be conducting bottom longline sampling for the first time on NOAA's statistical zone 21. With this new addition, we will be covering the entire Texas coast with this fishing gear.

Because of COVID-19 restrictions, we were not able to conduct SEAMAP sampling ourselves during the spring season. However, we managed to get into an inter-agency agreement with Texas A&M-Galveston (TAMUG) to conduct bottom longlining during this time. TAMUG was able to collect six out of ten bottom longline samples in statistical zones 17 through 19.

Starting on June 1, we resumed normal SEAMAP sampling and, except for the four missed bottom longline samples during the spring, we will be able to complete all bottom longline and vertical line sampling as scheduled. Bottom longline samples will be completed in September.

Vertical line sampling

In 2020, no stations were sampled. Since no 2020 samples were collected, the same 60 stations were kept for the 2021 sample stations. As of September 15th, 2021, 46 of the 60 stations have been sampled and the remaining 14 sites should be completed by the end of October. One issue that has come up with vertical line sampling is the size of the bait ("boston mackerel") that was received from our supplier (pic below). The massive size of the mackerel makes it very difficult to get an appropriately sized piece of bait for each hook size. Only a small portion of the tail section fits the 8/0 and 11/0, while most of the body is even too large for the 15/0 hook size when cut into steaks as shown in the SEAMAP VL procedure manual.

6. Other State Activities.

Fisheries Enhancement Program (Hatcheries)

During the 2021 fiscal year, the TPWD Coastal Fisheries Saltwater Enhancement Program stocked 27,194,588 fingerlings in Texas' public waters.

Table 4. Total Red Drum, Spotted Seatrout, and Southern Flounder fingerlings stocked into various Texas water bodies during FY 2021 (9/1/2020 – 8/31/2021).

Water Body	Red Drum	Spotted Seatrout	Southern Flounder
Aransas	1,878,539	1,451,181	17,216
Corpus Christi	600,957	170,195	
East Matagorda	610,246	729,513	
Galveston	4,184,570	964,315	
Lower Laguna Madre	4,711,006	1,001,616	
Sabine Lake	1,242,360	445,601	
San Antonio	842,260	16,006	
West Matagorda	2,975,412	2,618,463	
Upper Laguna Madre	960,892	558,825	

Freshwater			
Calaveras	650,312		
Kleberg Park	4,876		
Lake Bryan	196,724		
Victor Brauning	363,503		
Total	**19,221,657**	**7,955,715**	**17,216**

License Buyback Program

Shrimp

Buyback Round 39

- Application period closed January 18, 2021 (Open approximately 60 days)
- 13 applications received
- Currently reviewing bids
- Purchased a total of 8 (5 bay and 3 bait)
- Total purchase price was $65,000
- Avg. purchase price was $8,125

Finfish

Buyback Round 27

- Application period closed January 18, 2021 (Open approximately 60 days)
- 1 application received
- Total purchase price was $3,000

Crab

Buyback Round 24

- Application period closed January 18, 2021 (Open approximately 60 days)
- No applications received

Oyster

Buyback Round 4

- Application period closed January 18, 2021 (Open approximately 60 days)
- No applications received

Buyback Round 5 (since last report)

- Application period closed August 14, 2021 (Open 40 days)
- 1 application received; exceeded the Estimated Maximum Value. Did not purchase license.

Perry R. Bass Marine Fisheries Research Station Updates

PRB Projects

Sciaenidae otolith collection

Data analysis is ongoing for the Spotted Seatrout and Red Drum otoliths age/length data. Currently, we are still working on a manuscript dealing with Spotted Seatrout age and body growth over a near 30-year span. Spotted Seatrout and Red Drum otolith collections were discontinued in 2020. *This project will be removed from future TCC reporting.*

Eastern oyster (*Crassostrea virginica*) population genomics

This project consists of sampling oysters throughout the Gulf and generating a high resolution SNP genomic data set. Genomic sequencing of samples from Florida (*n* = 3), Louisiana (*n* = 2), Alabama (*n* = 1) and Texas (*n* = 11), has been completed. Sequencing and bioinformatics are being supported by the Marine Genomics lab at Texas A&M Corpus Christi (MGL). We have created a final variant file including nearly 20,0000 unique genomic loci that will be used for spatial genetic analysis; analysis of that data set is ongoing both at PRB and MGL.

A side project using these oyster samples examined morphological (shell shape) differences among oysters at the sample and regional scale. This analysis yielded significant spatial differences in shape that have now been reported in Marine and Coastal Fisheries (AFS, below).

*Hajovsky, P., J. Beseres Pollack, and J. Anderson. **2021**. Morphological assessment of the Eastern oyster (Crassostrea virginica) from the Gulf of Mexico. Marine and Coastal Fisheries. https://doi.org/10.1002/mcf2.10156*

Black Drum (*Pogonias cromis*) high-resolution population genomics

Previously noted life history differences between Black Drum from Baffin Bay as compared to other Texas inshore areas suggests the possibility of genetic divergence on a relatively small geographic scale. We have used microsatellite data, mtDNA and discriminant analysis of principle components (DAPC) to demonstrate weak but significant genetic divergence between Baffin Bay and other Texas bays. Samples were selected for a high-resolution genomic library, and these samples have now been sequenced using the reduced-representation "ddRAD" method. The results of this study have been reported in 2 publications in North American Journal of Fishery Management (AFS, below). *This project will be removed from future TCC reporting.*

*Williford, D., J. Anderson and Z. Olsen. **2021**. Phylogeography, population structure, and historical demography of Black Drum Pogonias cromis. North American Journal of Fisheries Management. https://doi.org/10.1002/nafm.10608*

*Anderson, J., D. Williford and Z. Olsen. **2021**. Estuarine level genomic variation confirms demographic and life history differences among Black Drum Pogonias cromis populations in Texas. North American Journal of Fisheries Management. https://doi.org/10.1002/nafm.10606*

Detection of white spot syndrome virus (WSSV) in wild Gulf shrimp

We measured the presence and prevalence of white spot syndrome virus (WSSV) in Brown and White Shrimp from Texas. We collaborated with Dr. Arun Dhar of the aquaculture pathology laboratory, University of Arizona, in obtaining an infection-positive control sample of *Litopenaeus vannamei* (Pacific White Shrimp). Additionally, we identified and utilized an appropriate PCR-based laboratory assay for detecting WSSV in Texas shrimp. The project was completed in FY2021, and we do not anticipate further sampling. The results of this study have now been reported at the Journal of Aquatic Animal Health (AFS, below*). This project will be removed from future TCC reporting.*

*Swinford, J. et al. **2021**. Diagnostic molecular investigation of white spot syndrome virus (WSSV) finds no infection in wild white shrimp (Litopenaeus setiferus) and brown shrimp (Farfantepenaeus aztecus) along the Texas Gulf coast. Journal of Aquatic Animal Health. https://doi.org/10.1002/aah.10126*

Detection of shrimp black gill disease in wild Gulf shrimp

We are continuing work on a study on the presence and prevalence of shrimp black gill (sBG) in White (*Litopenaeus setiferus*) and Brown (*Farfantepenaeus aztecus*) Shrimp in Texas. We have identified the pathogen that seems to drive this condition in Texas, using DNA sequencing technology. In 2019, *n* = 1,605 shrimp (White and Brown shrimp combined) were sampled and sBG detection was conducted using a PCR test coupled with lab examination/diagnosis. We are continuing and expanding our sampling effort for this project. Sampling has continued in 2020 and 2021. In an effort to assess impacts to Gulf commercial shrimping, we have partnered with Texas Agrilife Sea Grant extension and the offshore shrimp trawl fishing community to expand sampling offshore and link it directly to the industry. We anticipate sampling for this project will conclude in November 2021. A paper reporting the presence and prevalence of sBG has been published in Marine and Coastal Fisheries (AFS, below).

Swinford J., and J. Anderson. ***2021****. Prevalence of black gill (Hyalophysa lynni) in white shrimp (Litopenaeus setiferus) and brown shrimp (Farfantepenaeus aztecus) along the Texas gulf coast. Marine and Coastal Fisheries.* https://doi.org/10.1002/mcf2.10153

Observation of growth in two sizes of post-release Red Drum *Sciaenops ocellatus*

We are cooperating with the TPWD stock enhancement branch to determine whether there are differences in growth and body condition between stock enhancement Red Drum that are above versus below the size targeted at the time of harvest (35 mm). Samples of fish were collected at harvest, and individuals were fit with coded wire tags and released into wet lab tanks. Five trials have been completed (May, August, November 2020, May and August 2021) and data analysis is ongoing. Preliminary results suggest that fish below target have a higher mortality rate post-harvest, and there are also differences in daily growth between individuals above and below harvest targets. One additional trial is pending in November 2021.

Determination of hatching dates in wild Southern Flounder (*Paralichthys lethostigma*)

Young-of-the-year Southern Flounder are being collected during fishery independent sampling (TPWD). Otoliths are being extracted from all individuals and daily increment rings are being used to determine hatching dates for Southern Flounder. Hatching dates will be related back to environmental (water quality) conditions to understand spawning and hatching conditions for Southern Flounder in the wild. Daily rings are present and countable. We have also observed accessory growth centers that might be associated with metamorphosis. Additionally, a collaborative component to this project with the TPWD stock enhancement program has yielded direct comparisons of growth and metamorphosis in wild versus hatchery fish. Preliminary results of this study include (1) relative consistency in daily growth of hatchery versus wild fish, and (2) temporal and regional differences in the timing of metamorphosis (and ostensibly hatch), of Southern Flounder along the Texas coastline based on back-calculated growth from wild-caught fish over the last 30 years. Manuscript in preparation.

Taxonomic uncertainty in ladyfish (*Elops saurus versus E. smithi*) in the western Gulf of Mexico

Research conducted in the last decade described a new species of ladyfish, *Elops smithi*, which occurs in sympatry with *E. saurus* in the Gulf of Mexico. We have collected ~300 ladyfish specimens *via* TPWD fishery independent sampling. Morphological characters which diagnose each species have been counted and paired with mtDNA sequencing to take census of these species in Texas' waters. To date, both species have been identified in Texas, with *E.*

saurus (approximately 90% of specimens) encountered more frequently than *E. smithi*. We are now exploring microsatellite DNA markers as a means of identifying possible hybrids and are cutting and imaging otoliths to look for species-specific growth differences. Analysis is ongoing, expansion of this project to include other Gulf states will be considered, and coordination of this effort *via* GSMFC would be beneficial.

Determination of factors driving metamorphosis in Southern Flounder (*Paralichthys lethostigma*)

We are working collaboratively with staff two TPWD hatcheries (CCA Marine Development Center in Corpus Christi and Sea Center Texas in Lake Jackson), to run wet lab trials to determine the factors involved with the timing and rate of metamorphosis in flounder reared in captivity. Hatched flounder will be transitioned to Artemia feed at one or both hatcheries (depending upon availability) and reared under different experimental densities at our facility. An initial trial in February of 2021 resulted in limited success in retention and survival of experimental controls; a second trial will be initiated in winter of 21/22, and we plan to use environmental chambers to improve controls.

Investigating the use of environmental DNA (eDNA) for assessing presence and abundance of marine finfish in the coastal waters of Texas

We are in year 1 (out of 2) a proof-of-concept study to test the efficacy of eDNA as a sampling methodology in the various estuarine habitats in Texas. We are testing both a species-specific assay (Red Drum, qPCR approach) as well as a community assay (DNA metabarcoding) to detect marine species. To date, we have (1) produced a reliable Red Drum species-specific qPCR detection assay, (2) identified a reliable water sampling/DNA extraction protocol using Smith Root filter cups, and (3) used wet lab trials to test the efficacy of sampling, extraction and PCR steps. Side-by-side sampling at TPWD gill nets is anticipated in Fall of 2021. For future metabarcoding steps, we have built a DNA sequence reference file specific to the expected community structure of Texas' estuaries. The reference consists of 691 species that are commonly encountered in TPWD CF sampling gears and references a DNA sequence locus (mtDNA cytochrome oxidase) commonly used for barcoding studies. This reference file has been tested successfully by our staff against commonly used DNA metabarcode program pipelines. Funding is anticipated to be extended to Dec. 2022 through IJF small project funds (GSMFC).

Analysis of taxonomic uncertainty and field identification of snook (*Centropomus sp.*) (NEW)

In order to improve field identification of the two snook species that occur in Texas, we will pair morphological examination with genetic identification (DNA sequencing) in order to identify key characters for each species. Previous work in our lab has identified problems with using commonly employed keys to differentiate *C. undecimalis* from *C. mexicanus* in Texas. Additionally, age/growth curves generated from otoliths obtained from TPWD field-identified specimens indicate (1) 2 different growth trajectories, suggesting species-specific growth functions, and (2) data contamination of each growth function due to (presumed) misidentification in the field. For otoliths already on hand, we will explore improving taxonomic ID using species-specific differences in gross otolith morphology (i.e., fourier series shape analysis using the uncut, paired saggital otolith). Field sampling will begin in Fall of 2021 and field specimens will be used to validate otolith shape differences and further examine external morphological key characters using a number of published keys. We anticipate the following deliverables: (1) improvement of the key characters that can be used for field identification of

Centropomus sp. in Texas, and (2) taxonomic resolution of potentially mis-identified otolith snook specimens for accurate age/growth function analysis.

Collaborative projects

Range-wide population genetic structure of Alligator Gar (*Atractosteus spatula*)

In collaboration with Dr. Brian Kreiser, (University of Southern Mississippi), we are analyzing mitochondrial DNA (mtDNA) sequence data already on hand in our lab, in an effort to examine the range-wide population structure of the species. Dr. Kreiser is analyzing a microsatellite DNA data set, and together we will attempt to compare and contrast historical versus contemporary patterns of movement and demographic exchange among drainages in the Gulf of Mexico basin. We are in the final stages of preparing a manuscript detailing the results of this work.

Taxonomic uncertainty of *Menidia* sp. in Aransas and Galveston Bays

We are supporting the work of Dr. James Derek Hogan who is conducting targeted sampling for a rare all-female silverside species, *Menidia clarkhubbsi*. Dr. Hogan's group is looking for morphological characters that might distinguish this species from other species of *Menidia* and pairing his analysis with genomic sequencing in an effort to compare genomic loci among *M. clarkhubbsi* and the more common species *M. peninsulae* and *M. beryllina*. Data collection is complete, and analysis is ongoing.

Using Population Genomics to Inform Stock Enhancement and Ecosystem-Based Management of Spotted Seatrout *Cynoscion nebulosus* (NEW)

In collaboration with Drs. Portnoy and Hollenbeck (TAMUCC) as well as TPWD hatchery staff (Mace, Fincannon, Cason) we will be collecting YOY Spotted Seatrout in conjunction with TPWD routine monitoring samples (bag seines). The collections will serve two purposes: (1) examine genomic patterns of variation (population genetics), and (2) estimate the contribution of hatchery-origin Spotted Seatrout to fish sampled in the wild. An additional deliverable of this project will be a genetic linkage map that will be generated by examining full- and half-sibling crosses from hatchery Spotted Seatrout families. This project is funded through Sea Grant and is anticipated to last through 2024.

Fall 2021 IJF Activities

Red Drum Management Profile

In December, the Red Drum Technical Task Force had their first in-person meeting since the beginning of the pandemic. They met in Gulf Shores and reviewed all the current drafts. After the review session, the group went into a work session and continued drafting their sections. At this time, we have most of the document drafted but are still waiting on the economics and social chapters for review. We anticipate wrapping the document up in April or May of this year and hope to present it to the TCC for their review later this summer.

Mangrove Snapper Management Profile

The TCC will be asked to begin considering agency representation for the Mangrove Snapper Task Force during their meeting. Once a roster has been established, the new Task Force will look at dates in late summer to begin working on a Profile for this species.

Other Activities

Tripletail Genetics

We continue to process the existing Tripletail fin clips that we've received from collaborators around the eastern Atlantic and Indian Ocean. Staff presented initial results to the TCC at their meeting. Dr. Saillant (USM) sequenced over 650 fin clips from seven US states in the Gulf and South Atlantic as well as ten other countries (Australia, Suriname, Brazil, Peru, Malaysia, Senegal, Canary Islands, Mozambique, Turkey, and Benin) and should have more results this summer.

Acoustic Tagging

A large expansion of the telemetry array in the eastern Mississippi Sound has been established and working with both GCRL and the MS DMR, we have nearly gated the entire MS Sound. The expansion benefits a number of other ongoing studies being conducted by the GCRL staff as well as the Mississippi, Louisiana, and Alabama state agencies and regional academic institutions. Species expected to be encountered in the array include Gulf Sturgeon, Tripletail, Southern Flounder, Cobia, Red Drum, and Spotted Seatrout. The program purchased 50 Vemco V16 tags late summer to deploy in Mississippi but only put out two. Twenty-five additional V13s have been purchased for smaller Tripletail and will be deployed this summer. Staff made a trip to Florida Bay and succeeded in putting out some tags in the overwintering grounds. It is anticipated that the MS fish move south to FL in the Fall and the FL fish likely move back north in the Spring. These tags range in life from four to seven years and should aid in understanding the migration patterns of Tripletail in the Gulf.

Regional Flounder Symposium

The IJF staff and Drs. Midway and Dance at LSU/LA Sea Grant will host a large symposium on flounder issues in the Gulf and South Atlantic regions in two weeks. Fishery experts from each state in the Gulf and South Atlantic are attending to discuss what might be going on with flounder and develop a plan to address the population declines moving forward. The symposium is scheduled for March 29 and 30 in Baton Rouge at the Embassy Suites.

IJF State Research Funding or SuRF Program (formerly the IJF Small Grants Program)

Each state agency is working with their 2022 funds for various IJF research projects using IJ funding. $194,960 was available to each state in 2022. All the projects are basically continuations of the 2021 work and cover a variety of issues related to Blue Crab, Southern Flounder, scallops, and oysters as well as general commercial and recreational data collection on IJ species. We anticipate a similar funding level will be available for projects in 2023 and staff will work with the agencies once a final amount is determined later this spring.

Aquaculture Spring 2022 Update

Pilot Projects

The latest round of Pilot Projects (2022) was released as an RFP this past summer and a total of 19 projects was received. The Commission combined two years of funding for Pilots resulting in $1.14M being available for 2022. Nine projects were selected by the review team to fund for a period of one year. The projects are as follows:

FY2022 Gulf of Mexico Marine Aquaculture Pilot Projects Grants	
Applicant	**Project Title**
Florida Institute of Technology	Intensive practical training of women in Integrative Multi-Trophic Aquaculture: Towards a sustained mariculture workforce in Puerto Rico
Live Advantage Bait LLC	Advancement of Atlantic Croaker (*Micropogonias undulatus*) aquaculture
Florida Department of Agriculture and Consumer Services	Develop education and outreach tools, strategies or initiatives aimed at improving stakeholder understanding and perceptions of marine aquaculture
IFAS, University of Florida	Reevaluating co-culture of Eastern Oysters with sea urchins using hatchery-produced juveniles
Gulf Offshore Research Institute	Advancing the viability of oil rig-associated aquaculture
University of Miami – RSMAS	Advancing commercial-scale sustainable marine aquaculture: Identification and assessment of native seaweed species for aquaculture in the Gulf of Mexico and U.S. Caribbean Regions
IFAS, University of Florida	Development of oyster larval cryopreservation technology for commercial seed production
University of Southern Mississippi	Aquaculture of the Tripletail *Lobotes surinamensis*, a prime candidate for marine aquaculture in the U.S.
University of Southern Mississippi	Automated marine mammal monitoring system for Manna fish farms Gulf of Mexico

Integrated Multi-Trophic Aquaculture (IMTA)

Additional funds were provided to the Commission through NOAA for development of an Integrated Multi-Trophic Aquaculture (IMTA) demonstration project to culture native species of finfish, bivalve mollusks, and macroalgae in our region's state waters. The RFP was released in July with $1.8M available. One project was selected and we continue to work out the final details and the necessary NEPA and ESA consultation with NOAA. The Dauphin Island Sea Lab is in the process of identifying a site within Alabama state waters to place one AquaFort platform. There are a number of planning and coordination meetings underway and the team will begin recruiting farm participants once the NOAA reviews are completed. The team will be conducting a series of stakeholder workshops to engage the public to provide information on the system and the value of the product potential using this technology. Again, this is a demonstration project but will have a harvested product for local market as well as education and outreach. Much more information is to come once the initial reviews are completed.

Gulf Oyster Consortia

The Oyster Consortia has begun the third year of their project on oyster breeding and genetic selection. The Consortia will continue to cross founder broodstock lines from various regions in the Gulf and do growout of the crosses they have already completed. In addition, the repository of germplasm from the founder broodstocks will continue with inclusion of successive generations. Stored genetic material will be used to preserve original oyster populations as well as for selection in future crosses.

Past Awards

With regard to the previous projects, extensions were awarded to nearly all of the grant recipients as a result of the COVID shutdowns and work was delayed for most. As of today, all but two of the seven 2020 Pilots have completed their work. The last project of the four 2019 Pilots finally wrapped up after numerous issues related to missing the natural hard clam spawn and equipment failures in the hatchery.

Southeast Area Monitoring and Assessment Program (SEAMAP)
March 2022

The Fall Shrimp/Groundfish Survey took place last year from October 4 – November 23, 2021. SEAMAP sampled 274 stations during the survey. We had originally hoped to sample approximately 300 stations, but sampling effort was impacted by weather.

The Environmental Data Work Group met on February 22 and reviewed the environmental section of the trawling operations manual. All other SEAMAP sampling bases their environmental sampling off the environmental procedures within the trawling operations manual.

The Commission worked with the Fish and Wildlife Foundation of Florida, Inc. to acquire an acoustic camera and hardware for sampling reef fish. The Commission was able to purchase two Kongsberg Flexview HF Sonar cameras, underwater housings, and peripherals for FWRI to use during SEAMAP reef fish sampling. FWRI will use the cameras to develop techniques and protocols for reef fish sampling that SEAMAP can use in the western Gulf of Mexico. The equipment will be inventoried and managed by the FWRI's Fisheries Independent Monitoring program.

SEAMAP continues to discuss the future of the Vertical Line Survey. The SEDAR data workshop for Red Snapper will be held in early May. If data from the Vertical Line Survey are not used in the next Red Snapper stock assessment, the survey will probably be discontinued. The Subcommittee has discussed several options for how SEAMAP partners can contribute to existing or new surveys. Possibilities include more partners participating in the Reef Fish Survey through video sampling, acoustic sampling, or habitat mapping.

In 2022, SEAMAP plans to conduct the Spring Plankton Survey, Bottom Longline Survey, Vertical Line Survey, Summer Shrimp/Groundfish Survey, Reef Fish Survey, Fall Plankton Survey, and Fall Shrimp/Groundfish Survey.

The Commission continues to manage SEAMAP data and distribute the data to interested parties. The Commission has fulfilled two SEAMAP data requests since October. The various SEAMAP databases were download 90 times since October.

CARES Act Program
March 2022

The Coronavirus Aid, Relief and Economic Security Act (CARES Act) was signed into law on March 27, 2020. On May 7, 2020, the Secretary of Commerce announced the allocation of $300 million in fisheries assistance funding provided by Sec. 12005 of the CARES Act to states, Tribes, and territories with coastal and marine fishery participants who were negatively affected by COVID–19. Fishery participants include Tribes, persons, fishing communities, aquaculture businesses, processors, or other fishery-related businesses, who have incurred a loss, as a direct or indirect result of the coronavirus pandemic. Eligible fishery participants must have incurred an economic revenue loss greater than 35 percent as compared to the prior 5-year average revenue; or any negative impacts to subsistence, cultural, or ceremonial fisheries.

The Gulf states allocations were as follows.

Texas	$ 9,237,949
Louisiana	$14,785,244
Mississippi	$ 1,534,388
Alabama	$ 3,299,821
Total	$28,857,402

The Commission paid $8,010,737.26 to 134 Texas applicants on October 13, 2021. With these final direct payments to applicants, the CARES Act Program concluded all direct payments to all applicants across all four states. Overall, the Commission received 1,712 approved claim applications and paid 1,589 applicants a total of $28,057,705.89. The Commission is still waiting on a final administrative invoice from TPWD, but the original CARES Act program has been completed.

CARES Act 2.0

The Consolidated Appropriations Act, 2021 was signed into law on December 27, 2020. The Act provided an additional $300 million for fisheries disaster assistance. The funding was intended to respond to fishery related COVID-19 impacts previously authorized under section 12005 of the CARES Act. As previously specified in the CARES Act, fishery participants must have incurred an economic revenue loss greater than 35 percent as compared to the prior 5-year average revenue to be eligible for funding. The four Gulf states received a total of over $26 million to be distributed by September 30, 2021. The Commission refers to this new program as CARES Act 2.0.

Texas	$7,795,841
Louisiana	$12,477,165
Mississippi	$3,000,000
Alabama	$3,000,000
Total	$26,273,006

Texas did not open a new application period for their CARES Act 2.0 program since their first application period was for losses that occurred between January 1 through December 31, 2021. Using CARES Act 2.0 funds, TPWD proposed to pay in full all remaining claims that were not paid during the CARES Act. On November 1, 2021, the Commission sent $946,234.76 in payments to 99 Texas applicants. This left TPWD with a balance of approximately $6.5 million. TPWD originally proposed a media campaign that would promote, expand, and elevate the consumption of Texas Gulf seafood with the goal to unite, market and create consumer awareness for Lone Star shrimp, blue crab, fish, and oysters. TPWD also proposed to use funds to create oyster reefs.

In January, TPWD decided to give applicants a second chance to qualify for CARES Act 2.0 funds. During the initial CARES Act application period, some applicants did not provide all qualifying documentation or missed deadlines for submitting required documentation. TPWD decided to give these applicants a second chance to receive funding if they provided the needed documentation. In February, TPWD sent second chance letters out to 85 applicants, and they are currently working with the applicants to review their documentation. The media campaign and oyster reef creation are on hold until TPWD knows how much funding is available after these second chance appeals.

Louisiana sent their first CARES Act 2.0 approved applicant list representing 657 applications to the Commission on November 10, 2021. These 652 applicants were paid $11,475,510.01 on December 9, 2021. LDWF sent their second approved applicant list to the Commission on December 2, 2021. These 23 applicants were paid $340,063.13 on December 22, 2021. An additional 22-person applicant list and a final payment list were sent to the Commission on February 14, 2022. This list, for $355,558.38, has been sent to NMFS for final approval. Once NMFS approves this list, Louisiana will be finished with their CARES Act 2.0 program having provided $12,171,131.52 in payments to 697 applicants.

Alabama approved 65 applications for 63 applicants during their CARES Act 2.0 application period. The Commission paid $2,948,417 to these applicants on November 3, 2021.

Mississippi held their CARES Act 2.0 application period from October 20 through November 19, 2021. If applicants were not fully compensated for their losses from the original CARES Act, their application was automatically enrolled in the CARES Act 2.0 program. MDMR approved 419 applications for 277 applicants. The Commission sent out $2,923,033.59 in payments to these 277 applicants on January 25, 2022.

Sport Fish Restoration Program Update

Spring 2022

- The ASMFC and GSMFC are targeting sometime in late spring or early summer of 2022 for our next joint Artificial Reef Subcommittee meeting in hopes of being able to hold it in-person.

- Gulf Artificial Reef Monitoring and Assessment Program (GARMAP) Pilot Study: In an effort to better assess the water quality, including dissolved oxygen levels at artificial reef sites off the coast of Mississippi, the Program Coordinator is employing water quality monitoring multiparameter datasondes at several offshore sites. These datasondes are being deployed on the bottom and utilize an acoustic release system so there is no entanglement issues associated with a surface buoy and mooring line system. The datasondes will be deployed year-round in order to assess seasonal changes in water quality at the sites and to determine the prevalence and duration of low dissolved oxygen events.

  The Program Coordinator deployed the first three units in October of 2021. In December, the Coordinator was able to retrieve the units utilizing the acoustic releases, change out the datasondes, and redeploy the units in the same location. The units all functioned as planed and the anti-fouling modifications worked to keep all probes clean and the area around the datasonde clear of biofouling. The three datasondes collected over 11,000 data records during the first deployment. This data was added to the GARMAP database and website by the GSMFC's System Administrator where it is available to the public. Following the first successful three-month deployment, the Coordinator purchased the equipment to build three more units that will be deployed in offshore waters in 2022. The long-term goal of this effort is to develop a program that will provide standardized baseline data for artificial reefs across the Gulf of Mexico. This will allow states to assess impacts from natural and man-made disasters in the future, and to understand how their reefs are functioning over time, compared to natural reefs.

- The Program Coordinator worked with MSDMR to host the fourth year of the Jimmy Sanders Memorial Lionfish Challenge. Do to current circumstances, it was held as a virtual tournament utilizing Fishing Chaos. 31 lionfish were collected in 2021 and all prizes were distributed in December (1st place - Mark Miller, 2nd place – Asa Latham, most trips – Charles Martin). These efforts are made possible by the support from sponsors like Engel Coolers, Neritic Diving, ZooKeeper, and Fishing Chaos.

- We are working to increase funding for the program so the Commission can help to support and coordinate more Sport Fish Restoration activities across the Gulf of Mexico.

Aquatic Nuisance Species Program Update

Spring 2022

- The Program Coordinator set up and hosted the fall Gulf and South Atlantic Regional Panel (GSARP) virtual meeting on December 1st – 2nd.

- The Aquatic Nuisance Species Task Force's (ANSTF) fall meeting was held virtually on November 16th – 18th.

- Region 4 USFWS AIS Small Grants Program: Over the last seven years of this program, it has been able to fund 43 projects totaling over $1,000,000. In 2021 the program received 23 proposals totaling $1,094,399. Following the review and ranking of all proposals by the Panel's review committee, 4 projects were selected for funding totaling $177,693.
  - USGS - Leveraging habitat suitability modeling to inform management of nonnative fishes in a changing climate.
  - UF - A horizon scan to collaboratively identify invasive species threats to the islands of Puerto Rico and the U.S. Virgin Islands.
  - UT and NCSU - Invasive armored catfish (*Pterygoplicthys* spp.) and Midas Cichlid (*Amphilophus* spp.) in Puerto Rico rivers: Evaluations of invasion extent and efficacy of a physical control method.
  - MSU - Integrating chemical and biological controls for the aquatic weed *Alternanthera philoxeroides* (alligatorweed).

  The Program Coordinator will work with FWS regional staff to get the RFP for the 2022 funding opportunity distributed as soon as the regional office knows its available budget.

- Invasive Species Traveling Trunk: The GSARP's Education and Outreach workgroup will continue to explore other materials that can be added to the trunks to keep them new and relevant. They will also look at developing lesson plans to make it easier for teachers to incorporate the materials in the trunks into their science curriculums. The trunks have been utilized for 1,620 days since they were made available to the public in the summer of 2012.

- The Program Coordinator is chairing the ANSTF's Prevention Subcommittee which is tasked with addressing five key outputs of the new ANSTF Strategic Plan.

- The GSARP is hoping to hold their spring 2022 meeting in-person, however they may have to continue with a virtual format if it cannot get clearance under FACA.

- The spring ANSTF meeting will be held virtually in May or June.

FISHERIES INFORMATION NETWORK PROGRAM

The Fisheries Information Network (FIN) is a state-federal cooperative program to collect, manage, and disseminate statistical data and information on the marine commercial and recreational fisheries of the Southeast Region. The FIN consists of two components: Commercial Fisheries Information Network (ComFIN) and the Southeast Recreational Fisheries Information Network [RecFIN(SE)].

The scope of the FIN includes the Region's commercial and recreational fisheries for marine, estuarine, and anadromous species, including shellfish. Constituencies served by the program are state and federal agencies responsible for management of fisheries in the Region. Direct benefits will also accrue to federal fishery management councils, the interstate marine fisheries commissions, the National Park Service, the U.S. Fish and Wildlife Service, and the NOAA National Marine Sanctuaries Program. Benefits that accrue to management of fisheries will benefit not only commercial and recreational fishermen and the associated fishing industries, but the resources, the states, and the nation.

The mission of the FIN is to cooperatively collect, manage, and disseminate marine commercial, anadromous and recreational fishery data and information for the conservation and management of fishery resources in the Region and to support the development of a national program. The four goals of the FIN include planning, managing, and evaluating commercial and recreational fishery data collection activities; to implement a marine commercial and recreational fishery data collection program; to establish and maintain a commercial and recreational fishery data management system; and to support the establishment of a national program.

The organizational structure consists of the FIN Committee, two geographic subcommittees (Caribbean and Gulf), standing and ad hoc subcommittees, technical work groups, and administrative support. The FIN Committee consists of the signatories to the MOU or their designees, and is responsible for planning, managing, and evaluating the program. Agencies represented by signatories to the MOU are the National Marine Fisheries Service, U.S. Fish and Wildlife Service, National Park Service, Alabama Department of Conservation and Natural Resources, Florida Department of Environmental Protection, Louisiana Department of Wildlife and Fisheries, Mississippi Department of Marine Resources, Puerto Rico Department of Environmental and Natural Resources, Texas Parks and Wildlife Department, U.S. Virgin Islands Department of Planning and Natural Resources, Caribbean Fishery Management Council, Gulf of Mexico Fishery Management Council and Gulf States Marine Fisheries Commission.

The FIN Committee is divided into two standing subcommittees representing the major geographical areas of the Region: Caribbean and Gulf of Mexico. These subcommittees are responsible for making recommendations to the Committee on the needs of these areas. Standing and ad hoc subcommittees are established as needed by the FIN Committee to address administrative issues and technical work groups are established as needed by the Committee to carry out tasks on specific technical issues. Coordination and administrative support of the FIN is accomplished through the Gulf States Marine Fisheries Commission.

PROPOSED FUNDING ACTIVITIES IN 2022 FIN COOPERATIVE AGREEMENT

Coordination and Administration of FIN Activities ***$227,270***

This task will provide for the coordination, planning, and administration of FIN activities throughout the year as well as provide recreational and commercial information to the FIN participants and other interested personnel. This is a continuation of an activity from the previous year. This activity pertains to all modules of the program.

Collecting, Managing and Disseminating Marine Recreational Fisheries Data ***$4,517,939***

This task will provide for the conduct of the MRIP survey in Mississippi, Alabama and Florida for shore, for-hire, and private modes and will provide partial funding for LA Creel in Louisiana. This task will provide for coordination of the survey, an intercept survey of shore, for-hire and private boat anglers to estimate angler catch using the existing MRIP methodology utilizing electronic tablets for data collection in the field. The states will also conduct weekly telephone calls to a 10% random sample of the Mississippi, Alabama, and Florida charter boat captains to obtain estimates of charter boat fishing effort. This is a continuation of an activity from the previous year. This activity pertains to the Recreational Catch/Effort Module for all modes of FIN.

Operations of FIN Data Management System ***$204,557***

This task will provide for operations of the data management system for the FIN. This task will provide funding for the FIN Data Base Manager, ComFIN Programmer and part-time Metadata Coordinator. Responsibilities include further development of data modules structures; routine loading of Louisiana, Mississippi, Alabama, and Florida commercial catch data, Gulf biological data, Gulf recreational data; enter and maintain the metadata records into the InPort system and maintenance of DMS. This is a continuation of an activity from the previous year. This activity pertains to the Data Management Module of FIN.

Trip Ticket Program Development and Operation ***$1,604,746***

This task will provide for the further development and implementation of commercial trip ticket systems in the Gulf of Mexico. This task provides funding for Texas, Louisiana, Mississippi and Alabama to operate their trip ticket programs. Funding support is also being provided to support maintenance costs for barcode scanner software for Florida. Full implementation of trip tickets in all five Gulf States allows for a complete census of all commercial fisheries landings in the Gulf of Mexico. In addition, it provides funding for a contractor to implement and operate an electronic trip ticket reporting program that allows for a more efficient means for dealers to report the necessary data. This activity pertains to the Commercial Catch/Effort Module of FIN.

Gulf of Mexico Reef Fish Surveys ***$120,682***

This task will provide support for MRIP certified state specialized surveys that are implemented to improve precision and accuracy of reef fish landings and effort estimates in the Gulf of Mexico. Currently Alabama Snapper Check has requested support through this funding that was provided by the Modernizing Recreational Fisheries Management Act. The priority is to support state survey efforts and develop and improve electronic reporting tools used to collect data from anglers. This activity pertains to the Recreational Catch/Effort Module for all modes of FIN.

Southeast For-Hire Integrated Electronic Reporting Program ***T.B.D***

This task will provide support for a dockside validation survey of federally permitted for-hire captains that are reporting electronic logbook data to NOAA Fisheries SERO. The dockside

survey is being phased in starting in October 2021. The monies received in FY2020 and FY2021 will support 2022 sampling year activities. The monies submitted in the 2022 cooperative agreement will be used as pre-funding to partially support 2023 sampling year activities. This activity pertains to the Recreational Catch/Effort Module for all modes of FIN.

GRAND TOTAL **$6,675,194**

Fisheries Restoration Program Update – March 2022

Reduction of Post-release Mortality from Barotrauma in Gulf of Mexico Reef Fish Recreational Fisheries

The Program Coordinator continues to collaborate with NOAA Fisheries, FL Sea Grant, members of the project management team (PMT), and state resource management agency leads to work through the development and implementation stages of the project, which focuses on reducing post-release mortality from barotrauma in Gulf of Mexico recreational reef fish fisheries. This project is also known as the Return Em' Right program. Major achievements since the last update are below:

- Human Dimensions Survey: GSMFC began working with Southwick Associates (SA) in April of 2021 to develop and administer a series of Gulf-wide surveys of recreational reef fish anglers to better understand their knowledge, behaviors, attitudes toward, and perceptions regarding best handling and release practices for reef fish in the Gulf of Mexico. With assistance and support from state managers from FWC, ADCNR, MDMR, LDWF, and TPWD, we were able to effectively manage sampling frames and send out the baseline survey to recreational reef fish anglers in each of the Gulf states. Reaching the minimum target of 400 responses per state, we received approximately 4,200 responses total. Southwick is working to finalize data analysis and draft the baseline report, which should be complete by the end of March 2022. Once finalized, it will be made available.

- Research and Monitoring: In coordination with the PMT and representatives from the TCC, four collaborative studies were chosen to receive funding to investigate post-release mortality estimates for priority Gulf of Mexico reef fish species, and the effectiveness of FDD use and how it is related to depredation. Auburn University and Mississippi State University received funding to begin their studies in Spring 2021, while the University of Florida and Louisiana Department of Wildlife and Fisheries received funding to begin working in late Fall 2021. All are in-progress at various stages.

  The Program Coordinator has also been working with NOAA and state resource agency representatives from FWC, ADCNR, and MDMR to expand data collection through at-sea observer programs and dockside reef fishing validation surveys to include information on use of descending devices in the recreational fishery. GSMFC anticipates finalizing agreements for data collection to begin March/April 2022, ahead of most peak offshore fishing seasons in the Gulf.

- Outreach and Education/Gear Distribution: GSMFC's Project Coordinator continues working closely with Florida Sea Grant (FSG) and various other partners to plan the Phase II launch of the Return Em' Right (RER) program. During the pilot phase of the project, over 100 federally permitted for-hire reef fish captains took the RER training and received a free release gear package. Based on the pilot phase, improvements were made to the training and gear package. Currently plans and logistics are being finalized for Phase II where all private recreational anglers will be invited to participate and receive free release gear. Private recreational reef fish anglers can now pre-register on our website to be notified as soon as the training and free gear become available.

- Next Steps: The Program Coordinator will continue working with state leads to expand data collection with respect to use of descending devices in the recreation reef fish fishery, finalize the

baseline report for the Gulf-wide human dimensions survey, provide oversight and manage the four collaborative studies, and explore opportunities and provide support for outreach and education.

GSMFC is grateful for the support and resources the federal and state agencies have provided to make this program successful, and we look forward to continuing to collaborate to reach our shared goals to improve fisheries. For more up-to-date project details and to understand how NOAA is supporting this effort to restore reef fish species impacted by the 2010 Deepwater Horizon oil spill in the Gulf of Mexico, please go to the following URL: https://www.fisheries.noaa.gov/feature-story/noaa-and-gulf-states-marine-fisheries-commission-partner-restore-recreational-fish.

To visit the Return 'Em Right website to learn more about our outreach and education efforts, or for reef fish anglers interested in pre-registering to receive training and free gear, you may go to: https://returnemright.org/.

Alabama State Report
Gulf States Marine Fisheries Commission's
Spring 2022 – Florida meeting

Emerging Issues Pertinent to Gulf of Mexico Fisheries.

Regulatory/Administration

The AMRD determined final distribution amounts for those individuals and business entities who applied to Round II of Alabama's Coronavirus Aid, Relief and Economic Security (CARES) Act program and met the eligibility criteria. Distribution amounts and payment information was provided to the Gulf States Marine Fisheries Commission for payment.

Beginning in 2021, mandatory reporting of recreationally caught Gray Triggerfish and Greater Amberjack landed in Alabama was also required for owner/operators of private recreational and state charter vessels.

Activities Related to Artificial Reef Programs.

Phase II of the National Fish and Wildlife Foundation Alabama Artificial Reef and Habitat Enhancement Project continues to provide funding for reef fish habitat enhancement and monitoring projects in the inshore, nearshore, and offshore waters of Alabama.

The AMRD acquired authorization from the Army Corps of Engineers to construct four inshore reefs in Mobile Bay and construction specifications are currently being drafted. Additionally, multiple contracts totaling $7,393,200 to construct/deploy 1,659 artificial reef modules have been executed and construction is underway. To date, 823 juvenile reef fish shelters have been deployed under the previously mentioned contracts along water bottoms approximately 6-9 nm offshore of Alabama that were recently authorized as artificial reef zones by USACE. An additional 180 concrete/limestone tetrahedron-shaped reef modules measuring 25' in height have also been deployed under the previously referenced contracts along water bottoms approximately 35 – 45 nm offshore of Alabama. Finally, partnerships with the Alabama Wildlife Federation and Alabama Power have resulted in the construction of 29 artificial reefs approximately 6 – 9 nm offshore of Dauphin Island. These reefs consist of juvenile reef fish shelters, out of date equipment from the Barry Steam Plant, a 195' X 35' hopper barge and tetrahedron-shaped artificial reef modules measuring 10' in height.

A total of 176 individual reefs constructed by members of the public were inspected and permitted by AMRD staff for deployment in the Offshore General Reef Permit Zones offshore of Alabama. A majority of the reef structures consisted of chicken transport cages, prefabricated

concrete reef modules, and steel framed boxes. The structures were deployed between approximately 15 miles to 50 miles offshore of Alabama along water bottoms authorized for artificial reef construction activities.

Activities Associated with the Gulf of Mexico Crab Fisheries.

No derelict trap collection activities were conducted in 2021. AMRD continues to monitor the number of derelict traps and is currently working with our partners to determine if a derelict cleanup will be conducted in 2022.

Activities Related to Fisheries Dependent Data Collection.

1. APAIS

AMRD continued the tablet-based data collection of dockside Access Point Angler Intercept Survey (APAIS) interviews and validation of charter vessel activity to complement the NOAA Fisheries For-Hire Survey. From September 1 through December 31, 2021, AMRD samplers completed a total of 164 APAIS assignments and 1,204 anglers were interviewed. No assignments were cancelled during the reporting period. Semi-annual training and fish tests were given to APAIS staff in August 2021 and February 2022.

2. Biological sampling

The Biological Sampling Program for the collection of otoliths from recreationally harvested marine finfish continued during the reporting period. From September 1 through December 31, 2021 a total of 53 sets of otoliths were collected by AMRD staff representing 11 out of 13 primary target species. Additional funding from the Gulf States Marine Fisheries Commission to continue this program started on September 1, 2021 and will continue for 16 months.

3. Snapper Check

Alabama's recreational Red Snapper season opened May 28th and closed December 27th. Anglers were allowed to harvest red snapper during four day extended weekends (Fri.-Mon.). Preliminary Red Snapper harvest estimates for private vessel and for-hire vessel anglers from Alabama's Snapper Check program is estimated at 783,348 pounds and 151,069 pounds, respectively. The 2022 Alabama private recreational annual catch limit wasn't exceeded. AMRD received 6,381 private vessel and 705 state charter vessel landing reports.

4. SEFHIER

AMRD received funding through the commission this year to conduct dockside surveys of federal for-hire vessels (charter/headboat) that electronically report their catch under NOAA Fisheries' Southeast For-Hire Integrated Electronic Reporting (SEFHIER) program. The electronic reporting program was implemented on January 5, 2021 with the dockside survey portion of the program beginning October 1, 2021. The tablet-basded dockside surveys are

collected through an application developed for SEFHIER. From October 1, 2021 through December 31, 2021, AMRD samplers completed a total of 23 out of 30 assignments and out of the completed assignments, 21 federal for-hire captains were interviewed. During the reporting period, the initial 7 of 30 assignments were cancelled due to the lack of trained staff to successfully conduct the dockside surveys.

Activities Related to Fisheries Independent Sampling.

1. Shellfish

During our 2021 annual oyster reef assessment, the quadrat samples had a similar density of legal-sized oysters to that of the 2020 samples. The 2021 samples showed a reduction of spat and sub-legal oysters from 2020. The possible reason for reduced spat and sub-legal oyster abundance is extended washes of fresh water occurring for 89 days from February to March of 2021 and again for 55 days from June to August of 2021.

After analysis of the 2021 oyster reef quadrat surveys, the AMRD decided to open the public oyster reefs to harvest on October 4, 2021. Harvest continued for 79 working days and closed on January 21, 2022. Oysters comprising a total of 50,020 sacks (including standard AL commercial sacks plus standardized receationally harvested sacks) were harvested from oyster reefs on Heron Bay, Cedar Point West, and Cedar Point East. Alabama harvest averaged 633.17 sacks per day (min 14.2 / max 1043.40 sacks) and 127 harvesters per day (min 6 / max 204 harvesters).

The AMRD opened the reefs on the first four Saturdays of the season to provide an opportunity for youth participation in the harvest. On these Saturdays, the reefs were opened to harvest for all commercial and recreational harvest, however the reefs closed at 12:00 pm instead 2:00pm. Saturday harvests were discontinued after the first four weeks due to a lack of participation.

During the 2021 oyster season, AMRD continued to use our oyster reef grid system to manage harvest on individual reef areas. AMRD staff monitored grids in which harvest took place and opened and closed specific grids as needed to move oyster catchers off sufficiently harvested areas. This ensured that there was a more even distribution of harvest across productive reefs. Harvesters were be able see which grids were open and monitor their position within the grid system by accessing a web link on their smart phones.

The AMRD introduced and sold a new recreational harvest tag at the Oyster Management Station during the 2021 harvest season. Recreational harvesters were required to purchase a tag and attach it to whatever container they used to hold their recreational harvest. Recreational harvesters can harvest up to 100 legal-sized (min. 3 in.) oysters per person per day and oysters can only be harvested from reefs and at times open to commercial harvest. The introduction of this tag has allowed AMRD to collect data on recreational harvest which has been difficult to

determine in the past. A total of 1,177 recreational tags were sold. One hundred oysters is approximately 0.6 of a legal Alabama sack. Using this conversion factor, 1,177 recreational sacks equals approximately 706.2 legal commercial sacks. Our harvest of commercial, recreational, and total sacks is detailed below:

Commercial Sacks Harvested	= 49,314
Recreational Sacks Harvested (converted)	= 706.2 (1177 tags x 0.6)
Total Sacks Harvested	= 50,020

The AMRD obtained Natural Resources Disaster Assessment (NRDA) funding for the construction of an Eastern oyster hatchery and remote larval setting facilities. Construction should begin in Summer of 2022 with oyster spat production anticipated Fall of 2022.

2. SEAMAP

SEAMAP activities planned for 2022 include remotely operated vehicle video, vertical line, nearshore bottom longline and trawl surveys. The trawl cruise will be in conjunction with the Gulf Coast Research Laboratory as staff from Alabama and Mississippi are working from the same vessel for sampling from statistical zones 8-12. Alabama will not schedule an ichthyoplankton cruise as National Marine Fisheries Service will collect stations off Alabama for the foreseeable future.

3. Inshore Gillnet

Independent gillnet sampling was conducted each month for calendar year 2021using small mesh perpendicular sets with mesh sizes ranging from 2-4 inches, and large mesh parallel sets with mesh sizes ranging from 4.5-6 inches. A total of 237 of 240 scheduled hour-long sets were completed with a total of 59 different species sampled comprising 6,604 observed individuals. Hurricane Ida, bad weather, and staffing issues prevented us from completing 3 net sets in August. For the year, 1,689 otoliths were collected from sampled individuals in addition to taking measurements of length, weight, sex, and gonad weight.

Gulf Menhaden scales and otoliths age comparisons were completed and submitted earlier in the year. A comprehensive review of Sheepshead was conducted on independent and dependent data from Alabama waters. The analysis produced graphs for length-weight relationships, bootstrapped vonBertalanffy growth, gonadal somatic index (GSI) over time, gillnet size selectivity of gear, index of abundance over time, catch curve for survival, mean length at age (ages 1-4) over time, and a total length (TL) to fork length (FL) conversion. The table below is a list for each species of number caught, catch per unit effort (net sets), and otoliths collected for the entire year of 2021 from gillnets, trawls, seines, marine enforcement seizures, and other sources.

The table below is a list for each species of number caught, catch per unit effort (net sets), and otoliths collected for the entire year of 2021 from gillnets, trawls, seines, marine enforcement seizures, and other sources.

Species	Caught	CPUE	Otoliths		
			Gillnet	Trawl	Enforcement/ Misc
Atl. Croaker	587	2.4664	173	--	--
Bl. Drum	41	0.1723	40	--	--
Bluefish	15	0.0630	2	--	--
Fl. Pompano	2	0.0084	2	--	--
G. Flounder	1	0.0042	1	3	--
Gray Snapper	2	0.0084	1	1	--
Gulf Menhaden	1451	6.0966	--	--	--
Red Drum	39	0.1639	39	2	--
S. Kingfish	37	0.1555	37	57	--
S. Mullet	668	2.8067	416	--	--
Sand Seatrout	82	0.3445	64	--	--
Sheepshead	15	0.0630	15	1	41
So. Flounder	8	0.0336	6	1	--
Sp. Mackerel	74	0.3109	70	--	--
Sp. Seatrout	474	1.9916	470	--	--
W. Mullet	378	1.5882	263	--	--
Totals	**3874***	**--**	**1583**	**64**	**41**

**Total catch of fish species listed above.*

Gulf Menhaden scales and otoliths age comparisons were completed and submitted earlier in the year. A comprehensive review of Sheepshead was conducted on independent and dependent data from Alabama waters. The analysis produced graphs for length-weight relationships, bootstrapped vonBertalanffy growth, gonadal somatic index (GSI) over time, gillnet size selectivity of gear, index of abundance over time, catch curve for survival, mean length at age (ages 1-4) over time, and a total length (TL) to fork length (FL) conversion.

Other State Activities.

1. Mariculture

The Claude Peteet Mariculture Center (CPMC) continued stock enhancement efforts through the Fall and winter of 2021. Since mid-September, an additional 84,228 Spotted Seatrout were released into coastal Alabama waters. Trout spawning will continue in Spring 2022. Florida

Pompano spawning has been poor with the transition to a new spawning hormone. No additional fish were released since the last update. CPMC is making a strong push to rotate out all broodfish for the 2022 spawning season to see if this will be a remedy for the issue. Southern Flounder culture began January 2022 and will continue through March 022. Releases will begin in February 2022.

CPMC staff will continue to assist researchers from Auburn University who have been contracted using Inter Jurisdictional Funds (IJF) provided by the Gulf States Marine Fisheries Comission to conduct a cryogenic preservation study of Southern Flounder sperm. CPMC and Auburn University staff will continue to evaluate the most effective methods for cryopreserving Southern Flounder milt. In addition, fresh milt will be tested against previously cryopreserved milt to see the effects on survival and growth of larval fish.

2. Boating Access

Fort Morgan boat ramp and fishing pier remains under active renovations that include capping the seawall, pouring a concrete surface and installing railings for the construction of a fishing pier. Shoreline stabilization, expansion and resurfacing of the parking area at the Delta Port boat launch are completed. Repairs to the Pines boat ramp have been initiated with construction to begin sometime in 2022.

3. Outreach

The AMRD Fisheries and Enforcement sections participated in the Alabama Coastal BirdFest, an outreach event with school children. The Alabama Seafood Marketing Program continued with public relations, television commercials, print ads and articles, radio ads, billboards, distribution of marketing materials and sponsorships of events. The marketing program's website is www.eatalabamaseafood.com.

4. Enforcement

From October 2021 through February 2022, AMRD enforcement officers conducted 4,009 commercial fishermen intercepts, 10,593 recreational fishermen intercepts, 424 seafood dealer and processor inspections, 6,682 hours of patrol (combined vessel patrol and shore patrol), and boarded 2,354 vessels.

In 2021, the National Marine Fisheries Service implemented a requirement for the Federal For-Hire charter fishing industry; the Southeast For-Hire Integrated Electronic Reporting Program (SFHIER). This program requires all Federally permitted for-hire charter fishing vessels to electronically report each of their fishing trips, along with the total number of fishermen and a summary of fishes caught and their quantities. AMRD enforcement officers were very active during the charter fishing season to ensure that the vessels were following the new reporting requirements as well as helping educate the charter captains on the program.

As the restrictions related to Covid-19 continue to decrease, there are more and more outreach events taking place. As a result, the Enforcement Section's opportunities for outreach has drastically increased over the previous two years.

In January 2022, the Enforcement Section completed the newest expansion of the Coastal Remote Monitoring System with funding from a FEMA Port Security Grant. The grant provided $273,865 in funding. This funding allowed AMRD Enforcement to add two new camera locations, upgrade the storage capacity of captured video, and upgrade many of the older cameras to high-definition cameras. Cuttently, the 23 camera system can store high-definition video of the monitored boating access points and other high values areas for nearly six months at a time.

The Enforcement and Fisheries Sections continue work under a dual grant intended to monitor and protect marine mammals and marine turtles. One of the grant's objectives is to monitor turtle crawls and nesting areas to help prevent nest damage caused by the public. The funding also provides for materials that target the public and educate them the potential harm they can unknowingly cause on turtle nests and turtle hatching runs. Funding also provides educational material outlining the dangers caused by marine mammal interactions with people and how current laws related to these interactions are crucial to the protection of marine mammals and marine turtles. The two portable camera units, that were purchased with this grant, allow the biological (and enforcement) staff of AMRD the ability to monitor turtle nesting areas 24 hours a day, with live video feeds. When deployed, the cameras can track turtle movements, human interactions and monitor known nesting sites.

Gulf States Marine Fisheries Commission
Technical Coordinating Committee
Mississippi State Report (July 1, 2021 – December 31, 2021)

1. Emerging Issues Pertinent to Gulf of Mexico Fisheries

CARES Act

Mississippi received $2,960,079 CARES Act II funds, and those funds were distributed to eligible commercial fishermen, charter fishermen, and seafood dealer/processors in an equitable manner. The second round of CARES Act funding resulted in 252 eligible participants by MDMR. This eligible group consisted of 189 commercial fishermen, 41 charter fishermen, and 22 dealer/processors. Mississippi residents with the eligible in-state and out-of-state licenses self-certified over 35% lost revenue for the varying months identified in the spend plan, when compared to the same months in previous years.

2. Activities Related to Artificial Reef Programs

The Artificial Reef Bureau (ARB) continued monthly monitoring of fish assemblages and physiochemical parameters at selected inshore reef sites. In conjunction with the Gulf States Marine Fisheries Commission (GSMFC), the third annual Jimmy Sanders' Memorial Lionfish Challenge began May 14, 2021 and ran through December 1, 2021. During July through December, nine participants harvested a total of 19 lionfish, making a total of 38 for the entire year.

In December 2020, ARB staff began deployments of materials donated by Ingalls Shipyard into FH-13. Now completed, this project has contributed 8,096 tons of clean concrete material and 1,872 tons of steel H-beams to new artificial reef structures.

Monitoring was conducted on the new structures deployed in FH-13 via juvenile tagging studies. Juvenile fish traps were deployed on these sites and allowed to soak for one hour. All reef fish captured were weighed, measured, tagged and released. Fifteen total traps were set and retrieved. Data was collected from a total of 155 juvenile reef fish representing five species that were captured, tagged, and released.

The Artificial Reef Bureau received and stockpiled 16 truckloads of donated concrete culverts totaling 158 pieces from two separate contractors. These materials will be deployed at a future date and location to be determined by availability of funding.

Efforts to renew USACE permits for all nearshore artificial reefs are ongoing.

Having submitted three separate pre-proposals to NFWF for funding under the Gulf Environmental Benefit Fund, and receiving invitations to submit full proposals, Artificial Reef Bureau staff continues to work with NFWF to develop project objectives and procedures for all three projects. The projects under consideration are completion of Katrina Key, an inshore reef assessment, and enhancement of Cat Island, FH-8, FH-9/11, and FH-10 Reefs.

Five new lighted pilings with hazard signage were installed at Katrina Key to mark the reef boundaries of previously deployed material. These pilings replaced temporary hazard buoys deployed during the construction phase of the Katrina Key reef expansion.

3. Activities Related to Fisheries Dependent Sampling

MRIP

The Finfish Bureau (FB) continued to oversee the Marine Recreational Information Program (MRIP) in Mississippi. A total of 215 assignments and 861 surveys were completed July through December 2021 in Jackson, Harrison, and Hancock Counties. A total of 11 assignments were cancelled due to staff error (2), Hurricane Ida (7), and COVID-19 (2).

Trip Tickets

The FB collected commercial seafood landings data from processors, dealers, and fishermen utilizing the Mississippi Trip Ticket program. This data allows management of the resource and effective monitoring of the quota on Red Drum, Spotted Seatrout, and Southern Flounder. From July through December 2021, there were 3,181 paper and electronic trip tickets submitted for 322 commercial fishermen by 70 dealers participating in the trip ticket program. The number of commercial fishermen selling their catch using a Fresh Product Permit and participating in the trip ticket program was 52. After several beta versions the new commercial trip ticket reporting system, VESL, developed by BlueFin Data went live on July 1, 2021.The FB and the Shrimp and Crab Bureau (SCB) is continuing to work with BlueFin Data and Federal partners to make the new system available to federally permitted dealers. The FB and SCB are also working with BlueFin Data to develop an electronic reporting system for Mississippi Off Bottom Oyster Aquaculture (OBOA) in the form of a mobile application and a web based electronic monthly dealer ticket for the Mississippi Live Bait industry. The finalized forms are expected to be completed concurrently and will be available to OBOA harvesters and live bait dealers tentatively in 2022.

Age and Growth

The FB collected and processed 114 otoliths as part of the MDMR Biological Sampling Program from seven select species: Gray Snapper, Red Drum, Red Snapper, Southern Flounder, Spotted Seatrout, Tripletail, and one additional species, Golden Tilefish.

Tails ‘n’ Scales

Red Snapper is currently managed under amendment 50C to the Fishery Management Plan for Reef Fish Resources in the Gulf of Mexico. Mississippi along with the other gulf states moved into state management of Red Snapper beginning with the 2020 season. Management rules for 2021 were set for a private recreational and state for-hire season in state and federal waters off Mississippi to open May 28, 2021, at 12:01am and close July 5, 2021, at 11:59pm. The season re-opened on August 6, 2021, at 12:01am and closed August 8, 2021, at 11:59pm. The season re-opened fully on August 13, 2021, at 12:01am and closed September 6, 2021, at 11:59pm. The season re-opened fully again on October 1, 2021, at 12:01am and remained

open until November 21, 2021, at 11:59pm. The season was open for a total of 119 days. The private recreational sector's harvest for 2021 was 143,042.7 pounds, representing 94.4% of Mississippi's private recreational Annual Catch Limit (ACL) (151,550 pounds). The federal for-hire component was given an 86-day season, lasting from June 1 to August 1 and from October 15 to November 6. Vessels with federal reef fish permits are not included under amendment 50 but are required to obtain Tails n' Scales trip authorization prior to fishing. Mississippi's recreational Red Snapper electronic reporting system, Tails n' Scales began updates for use in the 2022 season after final closure of the 2021 season.

4. Activities Related to Fisheries Independent Sampling

Finfish Sampling

Long-term fishery independent sampling continued in conjunction with the NOAA Project "Monitoring and Assessment of Mississippi's Interjurisdictional Marine Resources". The FB completed 56 gill net sets at ten stations to collect finfish species for subsequent age-and-growth analysis as well as other biological data. A total of 172 otoliths were collected from July through December 2021 and samples were collected from ten different species: Sheepshead, Spotted Seatrout, Southern Kingfish, Striped Mullet, Red Drum, Spanish Mackerel, Southern Flounder, Black Drum, Sand Seatrout, and Gulf Flounder.

Through a project funded by the USFWS Sport Fish Restoration Program, the FB deployed 10 additional satellite tags on Atlantic Tripletail in the fall of 2021 as continuation of the 2019 and 2020 Atlantic Tripletail deployment dataset. One fish was recaptured, and staff redeployed the retrieved tag on an additional fish.

The acoustic telemetry work funded by the USFWS Sport Fish Restoration program for interagency, cooperative tracking of multiple species in Mississippi state waters continued. Acoustic receivers in the project array continued to undergo routine cleaning, maintenance, and data downloads. Some receivers had to be redeployed or replaced after tropical systems moved through the area. Ridged acoustic receiver mounts were constructed, and seven receivers were deployed onto the Pascagoula channel day markers. A total of nine receiver mooring buoys were constructed and deployed between Horn and Sand islands. Water temperature and conductivity data loggers were installed on four mooring buoys in the array. Traditional capture methods (hook and line) and experimental fyke nets were set up in the Biloxi Back Bay and Pascagoula to sample Southern Flounder. In the months of August, September and October, a total of 61 Southern Flounder were collected, externally acoustically tagged, and released. Sampling efforts for acoustic tagging of Cobia occurred in July, September, and October 2021. Although no additional transmitters were deployed in Cobia this year, two individuals that were tagged and released in 2020 did return to MS state waters. Both Cobia were detected on acoustic receivers between Ship Island and Horn Island. One individual was detected during September and remained detected within that area for roughly 18 days. The other Cobia was detected during October and remained detected for nearly 20

days.

The Fyke Net sampling program, which is used to target Southern Flounder, continued during the months of July through November. No sampling occurred in December. Fyke nets were set and retrieved on a bi-weekly basis at the three original sampling locations (Davis Bayou, Deer Island, and Belle Fontaine) and the two new additional sampling locations in Pascagoula that were established in June 2021. During these events, a total of 102 Southern Flounder were collected. Other species observed in the fyke nets included Atlantic Croaker 166), Blue Crab (125), Black Drum (23), Red Drum (19), Hardhead Catfish (17), Spot (10), Pinfish (7), Atlantic Spadefish (3), Southern Kingfish (3), Striped Mullet (3), Atlantic Stingray (2), and Gray Snapper (1).

Shrimp and Crab Sampling

The Shrimp and Crab Bureau (SCB) continued to conduct monthly fishery independent trawl sampling under the NOAA project "Monitoring and Assessment of Mississippi's Interjurisdictional Marine Resources". This sampling program includes 14 fixed stations located in the western Mississippi Sound and along a transect from Horn Island to the upper end of the Back Bay of Biloxi. Sampling was conducted using a 16' otter trawl with liner in the cod end. A total of 80 trawls were completed from July to December 2021. Five trawl samples were not collected for December 2021 in the Western Sound due to boat engine problems.

The SCB continued fishery independent trap surveys for Blue Crabs within three major estuaries: St. Louis Bay, Back Bay of Biloxi, and the lower Pascagoula River. Each estuary was sampled monthly from July to December 2021 for a total of 18 sample sets. This program, which began in September 2014, provides data on CPUE, size and sex composition, Blue Crab abundance, and bycatch composition and 273 sample sets have been completed since the beginning of the project.

The SCB continued to conduct monthly fishery independent shrimp trawls to monitor seasonal abundance and size of penaeid shrimp within the Mississippi Sound. This sampling program includes 10 fixed stations located across the Mississippi Sound from the mouth of St. Louis Bay east to Round Island using a standard 16' otter trawl. Sampling frequency increases to weekly in April and twice per week in May to monitor brown shrimp growth. A total of 62 trawls were completed from July to December 2021.

The SCB continued a fishery independent study using experimental gear types in Mississippi coastal waterways. The program was funded through the GSMFC IJ State ResearchFunding (SuRF) Program. Two experimental trawls, 6' and 12' otter trawls, were tested for collection of juvenile finfish, penaeid shrimp and blue crabs. Two samples were collected with each trawl size in each of the three coastal counties at randomly selected sites each month. A total of 72 small trawls were completed from July to December 2021.

The SCB also began a fishery independent crab trap survey in Mississippi commercial Blue Crab harvest waters. Six crab traps were placed at a randomly selected site in each of the three coastal counties every month to provide data on CPUE, size and sex composition, Blue Crab abundance, and bycatch composition. A total of 108 traps were set and pulled from July through December 2021.

Shellfish Sampling

The MDMR Shellfish Bureau (SB) conducts an extensive oyster reef assessment on all significant public oyster resources in state waters each year. This assessment includes one-minute dredge tows and diver square meter samples for analysis of oyster health, growth, productivity, abundance, and predatory behavior. This data is used for resource management and enhancement. From July through December 2021, the Shellfish Bureau conducted 124 dredge tows, 175 square-meter samples, and cultivated 160 acres of the western Mississippi Sound.

5. Other State Activities

State Records for Recreational Fishing

A total of 13 recreational fishing records were approved as state records July through December 2021. There were three Conventional Tackle records approved: Keeltail Pomfret (*Taractes rubescens*), Bull Shark (*Carcharhinus leucas*), Vermillion Snapper (*Rhomboplites auroubens*), Golden Tilefish (*Lopholatilus chamaeleonticeps*), and Inshore Lizardfish (*Synodus foeten*). A total of two fly records were approved: Shark Sucker (*Echeneis naucrates*) and Little Tunny (*Euthynnus alletteratus*). There were five youth records approved during the timeframe: Red Snapper (*Lutjanus campechanus*), Cownose Ray (*Rhinoptera bonasus*), Scamp (*Mycteroperca phenax*), and twice for Ladyfish (*Elops saurus*).

Live Bait Shrimp Licensing and Special Permits

The SCB manages the live bait shrimp licensing program. Inspections and technical assistance were provided, as needed, to the 10 licensed dealers across Mississippi's three coastal counties. The SCB also manages the MDMR Special Permitting program which includes Scientific Research Permits, Brood Stock Permits, Non-profit Harvesters Permits, and Experimental Gear Permits. SCB staff issued 19 Special Permits from July to December 2021.

Skimmer TED Reimbursement Program

MDMR Office of Marine Fisheries staff continued development and implementation of a program to reimburse shrimpers who purchase turtle excluder devices (TEDs) for their skimmer vessels. This project is intended to mitigate financial impacts to those vessels affected by the National Marine Fisheries Service (NMFS) December 20, 2019, final rule, which requires all skimmer vessels 40' in length and larger to use TEDs in their nets beginning August 1, 2021.

Approximately 9 shrimpers were reimbursed for their purchase of a TED from July to December 2021.

Derelict Crab Trap Removal Program

The SCB removed a total of 33 crab traps from the environment between July and December 2021. The Mississippi Derelict Crab Trap Removal program began in 1999, and to date, has removed a total of 22,283 traps from Mississippi state waters.

Oyster Aquaculture

The SB began training the fourth class of Off-Bottom Oyster Aquaculture Program (OBOA) participants in 2021. The OBOA Program addresses all aspects of off-bottom oyster farming appropriate to the local and regional area in oyster aquaculture operations, including business development and aquaculture methodologies. There is now a total of 465 acres available for commercial farming behind Deer Island. MDMR currently has 63 acres leased by 34 farmers and upwards of 3.3 million oyster seed being cultured. Commercial operations harvested approximately 100,000 oysters from July to December 2021.

Harmful Algal Bloom (HAB) Events

No significant HAB events occurred in the Mississippi Sound and relevant fishery areas in July through December 2021.

Shellfish Management

The SB monitors water quality and maintains molluscan shellfish growing water classifications as defined by the National Shellfish Sanitation Program through the Shellfish Sanitation and Compliance Program. This monitoring program mitigates the risk to human health from consuming raw oysters contaminated by fecal coliforms. These bacteria indicate the possible presence of pathogenic bacteria, viruses, and protozoans found in human and animal wastes. In addition to maintaining oyster growing waters classifications, the water quality samples are used to manage the openings and closings of oyster reefs for harvest. The samples are collected in sterile bottles by boat one-half meter below the surface on the windward side and transported to an FDA-certified microbiology laboratory for analysis. During the months of July to December 2021, Staff collected 341 routine water samples and 5 tissue samples from 62 sites across the Mississippi Sound.

Seafood Technology Bureau

The Seafood Technology Bureau (STB) conducted a total of 102 inspections (routine, follow-up, and certification inspections). A total of 77 sanitation and Hazard Analysis Critical Control Point (HACCP) deficiencies were cited. The bi-annual water quality sampling for seafood processing facilities for September was finalized with a total of 14 samples taken.

Due to COVID-19 restrictions in 2021, Basic Seafood HACCP training workshops could not be

held. Therefore, HACCP workshops were arranged to be taught in 2022. The first class will be held in February 2022. Depending on industry requests for additional training, HACCP workshops will be planned accordingly.

Remote Oyster Setting Facility Project

MDMR is in Phase I of the RESTORE Council-funded *Remote Oyster Setting Facility Project*. The purpose of the *Remote Oyster Setting Facility Project* is to provide a facility that has the capability to set 2.5 billion oysters/year to restore Mississippi's decimated oyster reefs at a faster rate than could be achieved in the wild. During Phase I, planning activities are being undertaken to assess the overall feasibility of the facility and determine infrastructure layout ongoing operational and maintenance costs, setting efficiencies and production milestones. The MDMR has identified the Port of Gulfport as the ideal location to situate the Oyster Setting Facility. MDMR successfully produced 11,703,819 spat on shell oysters over the course of six individual production runs that were completed within five months in the Summer of 2021. This equates to 16.18% of the oyster larvae setting/surviving until deployment. The average size of the oysters planted was 2.74mm for the season. In total, 46.8 cubic yards of spat on shell was deployed in Biloxi Bay on existing MDMR cultch plant locations. MDMR spent $68,227.11 for the entire season including staffing, boat usage, cultch material, equipment, and supplies which translates to $0.005 (half a penny) per oyster produced.

Gulf States Marine Fisheries Commission
Technical Coordinating Committee
2022 Louisiana Spring State Report

Contents

Emerging Issues Pertinent to Gulf of Mexico Fisheries

COVID-19 / CARES Act

The World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020. COVID-19 directly affected the United States (US) economy due to Stay at Home orders and the closing of all nonessential businesses. The US government acted quickly to assist the public when Congress passed the CARES Act and it was signed into law by President Trump onMarch 27,2020. The CARES Act was an over $2 trillion economic relief package that contained $300 million for the US Secretary of Commerce to provide to affected fishery participants. The Louisiana Department of Wildlife and Fisheries (LDWF) compiled a report showing losses in economic value by fishery and submitted to NOAA for approval. Louisiana is to receive a total of $14,785,244 in economic assistance for eligible fishery participants. The Gulf States Marine Fisheries Commission (GSMFC) will administer economic assistance to the eligible participants in LA through direct payments based on the approved LA Spending Plan.

LDWF developed an online application portal for its CARES ACT Program and contracted with South Central Planning and Development Commission (SPDC) for assistance with the application process. LDWF set its initial application period to open at 8am September 14 and set it to close on October 26 at 11:59 pm. During this time, 1335 application were received by LDWF. Due to the low turnout and a very active hurricane season, LDWF extended the application period until 11:59pm November 23. On November 14, LDWF held an in person application event in Lake Charles to assist those in SW LA who were affected by Hurricanes Laura and Delta. Thirty four people showed up at the event and LDWF collected 21 applications. By the end of the application period on November 23, LDWF received 1695 applications. By the end of June 2021 the review process was complete and 1175 applicants received a total of $14,397,430.90.

Due to the ongoing adverse impacts of COVID-19 on March 29, 2021 the Secretary of Commerce announced an additional $255 million in fisheries assistance funding provided by the Consolidated Appropriations Act of 2021 (3. NOAA Fisheries 2021). The Consolidated Appropriations Act of 2021 states that funding will support activities previously authorized under Sec. 12005 of the Coronavirus Aid, Relief, and Economic Security Act (CARES Act). Louisiana's allocation of the $255 million made available to fishery participants totals $12,477,165.

LDWF made some minor adjustments to its previously approved 2020 spend plan and made some minor modifications to its current online application portal. LDWF again contracted with South Central Planning and Development Commission (SPDC) for assistance with the application process and translation services. LDWF opened the application period August 9 through August 29, 2021. LDWF reviewed and processed over 1500 applications and submitted a finalized list of approved applicants to GSMFC in December of 2021. A second round of payments with the remaining CARES funds is scheduled to be submitted to GSMFC in February of 2022.

Hurricane Ida Impacts
Huricane Ida made landfall at Port Fourchon on August 29, 2021 as a major, category 4 storm. Hurricane Ida had a widespread area of impact, from western Terrebonne Parish to the Louisiana/Mississippi state line. An infrastructure assessement for each of the commercial fishery sectors has not been completed at this time. Losses within the shrimp, oyster and blue crab industries have been confirmed. Several processors suffered major to total losses of their facilities, while others received minor to moderate damage but a total loss of frozen product. Vessels have been reported on the opposite sides of levee systems, flipped in the marsh and bayous, and damaged. The alternative oyster culture industry took a major loss, while the traditional on bottom oyster reefs have encountered some muddy overbudern on reefs; clean up efforts have started to decrease mortality on the reefs.

LDWF has begun working with Louisiana Sea Grant to develop an economic damage assessment similar to what was completed after Hurricane Katrina, which will include both infrastructure and revenue losses of the commercial industry in the impacted areas. The assessment will utilize LDWF trip ticket and licensing data, geospatial wind and surge data, and information collected directly from those impacted.

LDWF's Fisheries Research Lab on Grand Isle survived the storm very well and sustained minor water damage. The island has been without power or water service since August 29. The lab is currently being utilized as a base of operations for the local authorities and the National Guard and is operating using generator power and regular fuel and water deliveries. While the lab serves this function, it will not be utilized by staff for LDWF operations. Contractually obligated sampling that normally occurs out of the lab is being conducted from several other locations.

Oyster Lease Moratorium
The Louisiana Wildlife and Fisheries Commission (LWFC) has approved a notice of intent for lifting the oyster lease moratorium. This public comment period has passed and the new regulations have been ratified. Currently, LDWF is coordinating with the Office of State Lands (OSL) and the Coastal Protection and Restoration Authority (CPRA) to work through Phase 0 oyster lease applications which is expected to conclude in the fourth quarter of 2022.

Activities Related to Artificial Reef Programs

Offshore
LDWF's Artificial Reef Program continues to assess and permit reef deployments related to offshore oil and gas structures. The Program has accepted three oil and gas structures.. There are 48 structures permitted for deployment as permanent artificial reefs, and one new reef site has been recently proposed. Permitting of an additional 43 structures is currently underway.

Multi-beam surveying of the Program's offshore reefs is ongoing (annually) and is available on the Program's website.

Inshore
LDWF's Artificial Reef Program enhanced the Independence Island artificial reef with 15,000 tons of crushed limestone in July 2021. The Program also holds a permit to enhance the Finfish Reef in Calcasieu Lake and has applied to enhance the Bay Ronquille Reef near Grand Isle.

Nearshore
LDWF's Artificial Reef Program completed two new nearshore reefs (Vermilion 69 and South Timbalier 51) and enhanced on existing nearshore reef (Bay Marchand 3) in partnership with CCA. The reefs were constructed with recycled concrete structures. The Program also has permits and agreements to create three more nearshore reef sites.

Monitoring
Through funds provided by the Louisiana Restoration Area Trustee Implementation Group, LDWF continued the monitoring of all completed inshore and nearshore artificial reef enhancement sites. This is part of a 5-year plan to assess the success of artificial reefs enhanced in an effort to mitigate for recreational use opportunities lost during the Deepwater Horizon Oil Spill. Monitoring efforts include the study of the aquatic organisms utilizing the reef enhancement sites via the use of gillnetting, rod and reel sampling, and benthic tray observations, as well as observations of recreational users. Together, those efforts are intended to provide insight into the overall biological health of the reef enhancement sites as well as insight into whether those sites are providing enhanced recreational opportunities to the public.

Activities Associated with the Gulf of Mexico Crab Fisheries

Policy and Regulations

During the 2021 Regular Session, Senate Bill 134 (SB134) was brought before legislation to ban nighttime shrimping in Lake Pontchartrain; this bill was drafted on behalf of the crab fishermen utilizing those state waters. SB134 was voluntarily deferred in the Senate Committee on Natural Resources and it was transistioned into a study resolution. Within the study resoltution, the crab task force and shrimp task force, with input from the Department, will study ways to minimize damage to crab traps in Lake Pontchartrain and report any recommendations to the Senate Committee on Natural Resources on or before February 4, 2022.

A letter from the crab task force and shrimp task force was sent to the Senate Committee on Natural Resources on January 20, 2022. The joint task force recommended that no additional regulations are placed upon the shrimp industry and that these advisory boards (task forces) are dedicated to work out common issues within each industry.

Derelict Crab Trap Program

The Louisiana Wildlife and Fisheries Commission (LWFC) adopted a Notice of Intent in August 2021 to establish four defined derelict crab trap cleanup areas during the 2022 harvest season. Within the four areas, the use of crab traps would be prohibited for up to fourteen days.

These closure areas are to be held within the Barataria Basin, Calcasieu Basin, Terrebonne Basin, and Vermilion-Tech Basin. A scheduled volunteer event is planned to take place on the first Saturday of the Barataria Basin closure and the Calcasieu Basin closure.

The closure are scheduled as follows:

- Terrebonne Basin – February 1, 2022 – February 14, 2022.
- Vermilion-Teche - February 1, 2022 – February 14, 2022.
- Barataria Basin – February 7, 2022 – February 20, 2022.
- Calcasieu Basin – February 18, 2022 – February 23, 2022.

A Pilot Program that was developed by the Department and Pontchartrain Conservancy was brought to the crab task force to gather interest and consideration. The crab task force requested a flyer be developed that could be used as a short survey to gather information from the local fishermen about participating in the Pilot Program. No resposnes were received and it was determined that the Pilot Program would be put on hold during the 2022 harvest season.

Sustainability

The fourth surveillance audit and reassessment of the Louisiana blue crab commercial trap fishery against the Audubon Nature Institute's Gulf United for Lasting Fisheries Responsible Fisheries Management (Gulf-RFM) Standard v1.2 took place on May 19, 2021. The final audit report and reassessment were published later in 2021 and recommended that the Louisiana blue crab commercial trap fishery remain certified.

The Louisiana Crab Task Force voted to have Global Trust take over the Marine Stewardship Council (MSC) assessments. Information for the third surveillance audit of the Louisiana blue crab commercial trap fishery against the MSC fisheries standards was gathered by Global Trust during the Gulf-RFM audit on May 19, 2021. The MSC final audit report recommended continued certification.

Stock Assessments

No formal stock assessment was completed for the Louisiana blue crab stock in 2022. Blue crab indices of abundance and model estimates were developed to assist with the two sustainability certification audits. Model estimates indicated that the Louisiana blue crab is not overfished or experiencing overfishing.

Landings

All landings data presented in this section are preliminary and subject to change.

Blue crab landings from July - December in 2021 totaled 24.5 million pounds with a dockside value of approximately $41.9 million. Landings from this period in 2021 showed an increase of two percent when compared to the five-year average (2016-2020), while the dockside value

increased by approximately 47 percent. With the increase of dockside value, the July – December 2021 average price per pound was $1.71, which is $0.52 above the five-year average.

Blue crab annual landings in 2021 totaled 45.4 million pounds with a dockside value of $86.7 million. Annual blue crab landings in 2021 were 11 percent above the five-year average, while the 2021 dockside value was 55 percent higher than the five-year average. Annual price per pound in 2021 was $1.91. Landings from January – Augusty of 2021 total approximately 33 million pounds, while the five-year average was 27.5 million pounds. A decrease of one million pounds was observed in Sepetmebr 2021 landings when compared to the five-year average due to the impacts of Hurricane Ida.

Blue Crab Biological Sampling

In the fall of 2020, the GSMFC awarded the Department with a grant from its IJ funding to sample commercial blue crab and collect data that will assist in characterizing the size and sex composition of commercially landed blue crab. Sampling began in January 2021, with each coastal study area (CSA) responsible for collecting data on 510 crab per two month period, or wave. There are a total of 5 CSAs, so an expected total of 2,550 blue crab are sampled every two months. A total of approxiamately 16,350 blue crabs were sampled during 2021 (data still being verified). Of the 16,350 crabs sampled, 12,018 were male and 4,332 were female. Market grade #2, or medium, consisted of 5,573 crabs sampled, while #1, or large, crabs sampled numbered 4,108. Additional market grades that are notable were staright run, females, and factory.

Activities Related to Fisheries Dependent Data Collection

LA Creel

Through the LA Creel program, 6,614 recreational fishing trips, comprised of 17,263 individual anglers, were surveyed dockside during 2021 Sample Weeks 27-52 (July 5, 2021 – JanuaryJan 2, 2022). Fifty-eight different interviewers completed 713 of the 806 assignments as drawn during the sample period. Fourteen additional assignments required site substitution. Two assignments were worked, but at the wrong site. In total, 729 assignments were worked. Tropical Storm Nicholas led to state office closures that resulted in the cancellation of two assignments. Hurricane Ida resulted in 72 assignment cancellations due to damage and lengthy state office closures. Three more assignments should have been worked, but were missed due to various reasons.

Fish kept by anglers and allowed to be viewed by interviewers are referred to as observation Type 1 fish. Fish in possession of the angler at the time of survey but not seen by the interviewer are classified as observation Type 2 fish. Although we count shellfish whenever present, LA Creel is concerned with finfish. For that reason, observation figures pertain to finfish only. For the sample period, 53,244 Type 1's, equalling 78 percent of all fish in possession of the angler at the time of survey, were identified and counted by staff. Type 1

observation numbers have been depressed since the onset of COVID in 2020 as social distancing became commonplace. There were 15,158 Type 2 observations made.

Ninety-four species were represented among Type 1 fish. Spotted sea trout was the most commonly counted species, with 27,573. Red Drum was second with 8,360 counted and Sheepshead was the third most common with 3,308 counted.

Certain species returned to the water or caught and used for bait are also recorded. Those species are:

1. Black Drum
2. Gray Snapper
3. Gray Triggerfish
4. Greater Amberjack
5. King Mackerel
6. Largemouth Bass
7. Red Drum
8. Red Snapper
9. Sheepshead
10. Southern Flounder
11. Spanish Mackerel
12. Spotted Seatrout

Fish thrown back because they were under the legal minimum length are coded as Type 3. Fish caught and used as bait during the trip are coded as Type 4. Fish thrown back or given away before being surveyed for any reason not covered by codes 3 and 4, such as too big, not wanted, etc., are coded as Type 5. Discard data is collected as per the Department's contract with GSMFC.

During the same period as provided above, staff recorded 39,458 Type 3's, 0 Type 4's, and 6,418 Type 5's.

In addition to the dockside survey, angler effort must be determined to generate harvest estimates. LA Creel uses two separate surveys to determine angler effort. One survey targets charter captains in which ten percent of the approximately 1,000 charter license holders and thirty percent of the approximately 140 charter license holders who also have a Recreational Offshore Landing Permit (ROLP) are drawn at random each sample week. The ROLP is a free permit required to possess tunas, billfish, swordfish, amberjacks, groupers, snappers, hinds, cobia, wahoo, and dolphinfish in Louisiana waters. The purpose of the ROLP is to increase the chances of drawing anglers who fish offshore for effort surveys. One hundred percent of ROLP holding charter captains are drawn during state and federal red snapper season. Department staff attempt to contact drawn captains to ask about the number of charter trips taken during

the sample week, how many paying customers were on each trip, and what basin the trip occurred in.

During 2021 Sample Weeks 27-52, 4,002 captains were drawn, with replacement. Of those, a total of 2,283 captains (57%) completed the survey. As a result, the estimated number of saltwater charter fishing trips taken during the period was 83,820.

The other effort survey pertains to private anglers exclusively. Each sample week, not including weeks that fall within Red Snapper seasons, a total of 1,600 Louisiana recreational saltwater fishing license holders are drawn at random for participation in the effort survey. Twelve hundred of the 1,600 are derived by drawing 300 licensed anglers from each of LA Creel's four regions to generate landings estimates. A separate random selection of 400 is made from ROLP holders. During Red Snapper seasons, the number of private ROLP anglers drawn for the effort survey increases from 400 to 800. A service contracted by the Department is tasked with contacting drawn license holders to ask questions, such as basin fished in, number of trips taken, about any saltwater fishing trips they may have taken during the sample week.

During 2021 Sample Weeks 27 – 52, a total of 49,600 Louisiana recreational saltwater fishing license holders were drawn, with replacement. Of those, a total of 24,390 (50%) completed the survey. The estimated number of private saltwater fishing trips taken during the period was 812,100.

The iPad application used for data entry of dockside surveys was to be rebuilt in the spring of 2019, but was pushed back to the spring of 2020. The contractor hired to perform the rebuild finished their work as scheduled and the rebuild was released to field staff in the fall of 2020. However, several issues affected performance and reliability. Although the app remains on field iPads, a new contract is being developed for the contractor to provide ongoing maintenance support so faults can be corrected and improvements made as needed. Final adjustments to a working version were underway in late fall 2021. A stable release is expected in early 2022.

Age and Growth

Since the new BIOFIN agreement covers recreational species only, LDWF's Age and Growth Lab in Baton Rouge relies on the National Oceanic and Atmospheric Administration's (NOAA) TIP sampling for commercial otoliths. The lab has processed recreational, commercial and independent otoliths during 2021. From July 1, 2021 through December 31, 2021, the lab has received 6,279 recreational marine fisheries otoliths and aged 4,856 of these otoliths. All otolith collection and ageing data has been transferred to GSMFC through the month of September. Staff are currently completing November and December otolith processing.

Otolith totals are as follows:

- Black Drum – 672
- Cobia – 9
- Gray Snapper – 30
- Greater Amberjack – 7
- Gray Triggerfish – 0
- King Mackerel – 0
- Red Drum – 1235
- Red Snapper – 759
- Sheepshead – 505
- Southern Flounder – 347
- Spotted Seatrout – 2453
- Striped Mullet – 167
- Tripletail - 20
- Vermilion Snapper – 29

Commercial Shrimp, Oyster, and Crab Seasons and Landings

Shrimp

The 2021 fall inshore shrimp season opened on August 9, 2021 in all state inside waters except for the portion of Louisiana inside waters known as the Biloxi Marsh, which opened on August 27, 2021..

The 2021 fall inshore shrimp season closed in all state inside waters on December 20, 2021 except for the open water areas east of the Mississippi River: Lake Pontchartrain, Lake Borgne, Mississippi Sound, and the open waters of Breton and Chandeleur Sounds.

Shrimp landings (all species combined and heads on unless specified otherwise) between July - Decemebr 2021 totaled approximately 41.8 million pounds with a dockside value of $75.1 million. The 2021 shrimp landings during this period decreased by approximately 17 percent compared to the five-year average, while the dockside value fell by 3 percent. While overall numbers in 2021 were low compared to the five-year average, the shrimp average price per pound in this period was $1.80, which is $0.27 above the five-year average.

Louisiana brown shrimp landings during the time period mentioned above in 2021 are typically low since the spring inshore shrimp season has closed, but landings totaled 4.2 million pounds with a dockside value of $7.1 million. This was a decrease of 21 and 6 percent when compared to the five-year average, respectively. Price per pound for brown shrimp was $0.27 above the five-year average during this period. Brown shrimp annual landings in 2021 were up slightly compared to 2020, but were 40 percent below the annual five-year average; annual brown shrimp dockside value was 10 percenet below the five-year average. While landings have been down the past three years, the five-year average is skewed by the abnormally high brown

shrimp landings in 2018 (42 million pounds). Brown shrimp price per pound in 2021 was the highest it has been during the reporting period.

White shrimp landings in July – December 2021 showed a 17 percent reduction from the five-year average, but was slightly above 2020 landings. More than 37.4 million pounds of white shrimp were landed during this period with a dockside value of $67.9 million. Even with the landings reduction in this period, the 2021 dockside value was only 2 percent below the five-year average; price per pound during this period of 2021 was nearly $0.30 above the five-year average. White shrimp annual landings in 2021 totaled 54.1 million pounds and had a dockside value of $102.6 million. Landings in 2021 were 13 percent below the five-year average, but the high price per pound lead to a 4 percent increase in dockside value when compared to the five-year average.

Blue Crab

Described in the Activities Associated with the Gulf of Mexico Crab Fisheries section above.

Oyster

The table below summarizes the 2021-2022 Louisiana public oyster ground season through the end of calendar year 2021. The goal was to reduce harvest stress on the resource, allowing for continued recovery, while continuing to use thresholds from the shell budget model.

2021-2022 LDWF Oyster Season Summary (As of January 4, 2022)

CSA	Area	Season Opening	Season Closure	Season/type	Days open	Harvest
1	POSG East of Mississippi river and North of MRGO	closed				
	POSG East of Mississippi river and South of MRGO	closed				
3	Hackberry Bay	closed				
	Little Lake, Barataria Bay	closed				

5	**Deep Lake, Lake Chien, Lake Felicity and Lake Tambour**	closed				
	Bay Junop, Lake Mechant	closed				
	Sister Lake	25-Oct	25-Oct	Seed Harvest	1	1,105 bbls
		26-Oct	29-Oct	Market Harvest	4	1,334 sacks
6	**Vermilion Bay**	closed				
7	**Calcasieu Lake**	1-Nov	TBD	East Side: Market Harvest	65	151 sacks
		1-Nov	TBD	West Cove: Market Harvest	65	2,299 sacks

*Harvest numbers are reported through LDWF surveys conducted during oyster fishing activities.

Activities Related to Fisheries Independent Sampling

Stock Assessments

LDWF completed an update stock assessment of Striped Mullet in November of 2021 that was presented to the LFWC for transmittal to the Louisiana Legislature in February 2022. This assessment uses a statistical catch-at-age model to estimate annual time-series of spawning stock biomass and fishing mortality rates. Time-series of fishery catches-at-age along with a relative abundance index developed from the LDWF fishery independent marine experimental gillnet survey are the primary model inputs. Based on results of this assessment, the Striped Mullet stock is currently not overfished or undergoing overfishing.

LDWF presented an updated assessment of spotted seatrout to the LWFC in November 2021. This assessment also uses a statistical catch-at-age model to estimate annual time-series of spawning stock biomass and fishing mortality rates. Time-series of fishery catches-at-age along with relative abundance indices developed from the LDWF fishery independent marine experimental gillnet survey are the primary model inputs. This was the second update assessment in the last two years, both updates indicated the stock is overfished and undergoing overfishing. The LWFC has not adopted any management changes to date.

LDWF began a stock assessment of Red Drum in 2021 that will be completed in 2022. This assessment also uses a statistical catch-at-age model to estimate annual time-series of spawning stock biomass and fishing mortality rates. Time-series of fishery catches-at-age along with abundance indices developed from the LDWF fishery independent marine trammel net survey, the LDWF component of the SEAMAP nearshore bottom long line survey, and the historic NOAA Fisheries mark and recapture population estimates are the primary model inputs.

Fisheries Research Lab

LDWF's Fisheries Research Lab in Grand Isle is the base for the state's research projects offshore fisheries independent monitoring. The lab also serves as a point of contact for the public, visiting researchers, and educational programs. Some current activities at the lab are summarized below:

Southeast Area Monitoring and Assessment Program (SEAMAP)

LDWF participated in three SEAMAP surveys: Shrimp/Groundfish, Vertical Line, and Bottom Longline. If not for Hurricane Ida, LDWF would have also participated in Plankton sampling for SEAMAP, but we were unable. The summer Shrimp/Groundfish survey was completed over three days with environmental and biological data collected at 21 stations during the survey period. Fall Shrimp/Groundfish was restricted to 1 day of sampling due to weather and 6 stations were completed. The Vertical Line survey sampled 64 sites on a mixture of platform, artificial reef, and natural bottom habitats from July through August. Bottom Longline sampled July through October and is split into summer and fall sampling periods. The all seasons Bottom Longline sampling has yielded 37 stations sampled with 10 and 27 stations in summer and fall during this reporting period, respectively.

Black Drum Life History Study

In winter and spring of 2021, the Fisheries Research Lab sampled 112 Black Drum females. Ovaries were taken from all 112 females and all have been histologically processed. Hurricane Ida has slowed our ability to process samples but fecundity samples will be counted after sheepshead fecundity is completed. The majority (48%) of Black Drum sampled were age 21-25 while 24 and 19 percent were from ages 15-20 and 25-30 years, respectively. When analysis is completed, this data will determine if spawning stock biomass is an appropriate proxy for total egg production and will further inform managers for establishing regulations.

Sheepshead Life History Study

In 2021, LDWF biologists sampled 141 female Sheepshead from March through May. Histological processing revealed that 79% of the females collected were in spawning condition, which led to the ongoing processing of 93 fecundity samples from hydrated individuals. Currently, we have prepared and scanned 53 fecundity samples, but have yet to count them. Ages range from 2-9 years with age 3-5 accounting for 71% of the sample.. Sheepshead look to be daily spawners that spawn for only two months. When data analysis is complete, this data will determine if spawning stock biomass is an appropriate proxy for total egg production and will further inform managers for establishing regulations.

Southern Flounder Experimental Gear/Fyke Net Pilot Survey

Southern Flounder adults are not well represented in the current LDWF independent sampling. Gillnet and trammel net surveys have been sampling very low numbers of Southern Flounder and the trawl surveys have mainly caught juveniles. Quantitatively, the annual average Southern Flounder catch rate from 2015-2021 in trammel nets was 4.9% of the stations sampled and 1.4% in gillnets. Because of this data gap, fyke nets are currently being tested to

potentially establish a new fisheries independent survey. A traditional fyke net with an all hoop cod-end was oringally used but only yielded 3 Southern Flounder in 4 months of sampling. Once a switch was made to a modified fyke net with a box on the front of the net, catch significantly increased to 166 Southern Flounder with 92 net-days from October 19th through December 2021. There was also an effort to sample with the oringal fyke net in the Fall of 2021 but there were only 5 caught from 42 net-days. Percent positive catch was 51.1% for the modified fyke net whereas the oringal fyke net had a 4.3% catch rate. It seems obvious that the change from a hoop front to a box front of the net has made a large difference in Southern Flounder catchability. Sampling will continue through April and final anaylsis for the year will be reported then.

Artificial Reef Monitoring for Sportfish

In order to enhance the monitoring of sportfish species on artificial reef structures, LDWF biologists from the Grand Isle Fisheries Research Lab are using a combination of vertical line sampling, video sampling, and diver surveys. A total of 30 artificial reef structures were sampled using both hooked vertical line and camera gear and 4 structures were sampled by divers with camera recordings. Over 80% of the vertical line catch was comprised of Red Snapper, which had a 41% positive catch rate from all hook sizes. Overall, in positive catch samples, 2.93 Red Snapper were caught per hook-hour. Video analysis has been delayed due to Hurricane Ida.

Shrimp Sampling

LDWF conducts fisheries independent sampling for shrimp year-round statewide using three trawl sizes: 6-foot, 16-foot, and 20-foot. The 6-foot trawl samples gather data in the interior marshes of Louisiana and are used to set the opening and closing dates for the spring inshore shrimp season. These samples are typically taken throughout April and again at the end of June and beginning of July, depending on environmental conditions. From July - December 2021, a total of six 6-foot trawl samples were conducted. Throughout 2021, a total of 294 6-foot trawl samples were conducted. A small portion of these samples were collected as a component of a monitoring agreement with another state agency and not for monitoring the resource for a closure.

The 16-foot trawl sampling data are used to constantly monitor the state shrimp resource, along with other species of interest, and set the opening and closing dates for the fall inshore shrimp season. During July - December 2021, a total of 715 16-foot trawl samples were conducted. A total of 1,623 16-foot trawl samples were conducted throughout 2021.

The 20-foot trawl sampling data are used to monitor shrimp resources in state offshore waters. A total of 117 20-foot trawl samples were conducted during July - December 2021. Data collected in the 20-foot trawl samples were used to open and close portions of state offshore waters.. These samples are primarily taken during the winter and spring months. A total of 242 20-foot trawl samples were taken in 2021.

Crab Sampling

Fisheries independent sampling data for blue crab is collected with 16-foot trawls. These data are used to calculate juvenile and adult blue crab indices of abundance for the blue crab stock assessment.

Oyster Sampling

LDWF conducts fisheries independent sampling for oysters year-round, statewide, using two gear types (24-inch hand dredge and square-meter frame: m2) within the public oyster areas, and analyzes the data collected to determine overall health of the oyster resource throughout the year. Dredge sampling was conducted monthly, except the month of July, on 72 sampling stations. Stations are representative of known and historical public ground reefs. Station locations range from the Louisiana/Mississippi state line to the western shore of Calcasieu Lake. In addition, six stations in Sabine Lake were dredge sampled quarterly during the reporting period. Two dredge replicates were taken per station to monitor size frequency, presence and/or absence of resource, and mortality. A total of 740 dredge samples were collected between July 1,2021 and December 31, 2021.

LDWF biologists performed quantitative evaluations using SCUBA equipment to collect oyster samples from within a square-meter frame as part of LDWF Annual Oyster Stock Assessment, and as part of the System-Wide Assessment and Monitoring Program (SWAMP). Annual stock assessment samples are taken in July of each year, at each station; five replicate square-meter samples are collected and data combined to produce average density of spat, seed, and sack oysters per meter. Oyster density was multiplied by the associated reef acreage to obtain an estimate of total oyster population size. There are currently 102 square-meter sites in the database, resulting in 510 samples being collected.

Sabine Lake was closed to oyster harvest by Act 159 (RS2018). To reduce program costs, dredge sampling is conducted quarterly in Sabine Lake and square-meter sampling is conducted during odd-numbered . years. As per the schedule, the six Sabine sites were sampled in 2021 for the Annualannual Oyster Stock assessmentAssessment (OSA). The data from that sampling is reflected in the totals presented.

LDWF conducts additional square-meter oyster “SWAMP” (System-Wide Assessment and Monitorinng Plan) sampling in the spring and fall in the Pontchartrain and Barataria Basins under an agreement with the Louisiana Coastal Protection and Restoration Authority (CPRA). During OSA sampling, sampling is conducted at 25 SWAMP-specific stations in the Barataria Basin (. Those stations are located on private oyster leases. Unlike OSA sampling, which requires five replicates per station, only 3 replicates are taken for SWAMP sampling. During the Fall SWAMP sampling event, which occurred in September/October 2021, 228 samples were taken from 42 sites in the Pontchartrain Basin and 34 sites in the Barataria Basin.

LDWF uses oyster stock assessment information to make recommendations regarding setting oyster seasons to the Louisiana Wildlife and Fisheries Commission. Seasons can open as early as

mid-September and can run through the end of April of the following year. Seasons may be closed or delayed if biological concerns or enforcement problems are encountered.

Finfish Sampling

LDWF conducts biological monitoring for finfish statewide in the coastal, nearshore, and offshore areas of Louisiana. During fiscal year 2020-21, the fisheries independent finfish sampling program collected 948 gillnet samples, 1,264 seine samples, and 264 trammel net samples for a 98 percent overall completion rate statewide. Electro-fishing samples (144 total) are being conducted within some Louisiana estuarine environments to provide fisheries data to CPRA. Some minor reductions in sampling will be realized in fiscal year 2021-22 sampling, especially the July through December period due to impacts from Hurricane Ida.

Other State Activities

Finfish Seasons and Regulations

Louisiana waters opened to the commercial harvest of King Mackerel on July 1, 2021, concurrent with an opening in federal waters.

Louisiana waters reopened to the commercial harvest of Blacktip and small coastal sharks on July 1, 2021 after a seasonal closure from April 1, 2021 through June 30, 2021.

Louisiana waters reopened to the recreational harvest of Greater Amberjack on August 1, 2021 through October 31, 2021 after a seasonal closure from June 1, 2021 through July 31, 2021, concurrent with a reopening in federal waters.

Louisiana waters reopened to the commercial and recreational harvest of Gray Triggerfish on August 1, 2021 after a seasonal closure from June 1, 2021 through July 31, 2021, concurrent with a reopening in federal waters.

Louisiana waters opened to the commercial harvest of Florida Pompano with strike nets from August 1, 2021 through October 31, 2021.

Louisiana and federal waters closed to the recreational harvest of Red Snapper on September 6, 2021 and reopened on September 24, 2021 for a daily season with a four fish bag limit.

Louisiana waters closed to the recreational harvest of red grouper and gray triggerfish on September 15, 2021, concurrent with a closure in federal waters.

At its regular meeting on October 8, 2021, the LWFC ratified a Notice of Intent (NOI) to add coastal buffer zones to commercial menhaden harvest regulations. Public comment was being accepted through Thursday, December 2, 2021.

Louisiana waters closed to the commercial and recreational harvest of lane snapper on October

18, 2021, concurrent with a closure in federal waters.

Louisiana waters opened to the commercial harvest of Striped Mullet with strike nets on October 18, 2021.

Louisiana waters closed to the commercial harvest of Gulf Menhaden for reduction on November 1, 2021.

Louisiana waters opened to the harvest of bait Gulf Menhaden on November 2, 2021 and closed on December 1, 2021.

Louisiana waters closed to the recreational harvest of Gag on December 31, 2021.

Louisiana waters closed to the commercial harvest of Spotted Seatrout on December 31, 2021.

Louisiana and federal waters closed to the recreational harvest of red snapper on December 31, 2021.

Marine Mammal and Sea Turtle Monitoring

The marine mammal stranding program and the sea turtle stranding program are administered and coordinated directly by NOAA in Louisiana.

Michael C. Voisin Oyster Hatchery

The Michael C. Voisin Oyster Hatchery located on Grand Isle, Louisiana, is operated through a collaborative effort between LDWF and Louisiana Sea Grant (LSG).LSG assists with facility operations, provides technical guidance, manages the LSG Breeding Program, and supports the oyster industry through extension, outreach, and research projects.LDWF focuses on the production of diploid and triploid seed and larvae for state restoration projects, as well as commercial sales to support the industry.

Fall 2021 Season

The Fall 2021 hatchery production focused on producing diploid and triploid pediveligers and seed for LDWF sales. Hatchery operations were significantly impacted by Hurricane Ida (August 26, 2021). Prior to Hurricane Ida, approximately 638,498 diploid and triploid pediveligers were set on 250 micron microcultch to produce seed for LDWF sales. All of these larvae set were lost due to Hurricane Ida.

Pediveligers set in the previous reporting period to produce seed for LDWF sales (9,962,951 diploid and triploid pediveligers) were lost in the Michael C. Voisin Oyster Hatchery nursery due to loss of critical utilities on Grand Isle.

In addition to oyster larvae, the Michael C. Voisin Oyster Hatchery also produces all of its own marine microalgae to feed to the oyster larvae. In the Spring 2021 season, the microalgae continued to experience water quality issues. Different culprits were looked into such as: water quality (i.e. vibrio, bacteria, toxins, and heavy metals), filtration issues, and contamination. It was also determined that our LED lighting may not be optimal for the growth of our marine microalgae.

Spat on Shell Projects

The Michael C. Voisin Oyster Hatchery produces diploid oyster larvae for setting on shell, which is then referred to as spat-on-shell and is used for State oyster restoration projects.To prepare for setting on shell, mesh bags that are three feet long are filled with recycled oyster shell and are called shellbags. Recycled shell were obtained through a collaboration with the Coalition to Restore Coastal Louisiana's Oyster Shell Recycling Program. In 2021 there were three spat-on-shell (SOS) deployments—one: first deployment in May deployed in Karako Bay (Biloxi Marsh/Pontchatrain Basin); and the second oneand third deployments in June and August, respectively, to Independence Island (Barataria Bay Basin). Follow up monitoring to assess survival success are typically scheduled for months 1, 6, and 18 post deployment, weather permitting.

In November 2021, no resource was found at Independence Island., most likely due to sedimentation and strong currents due to Hurricane Ida.Karako Bay SOS deployment was sampled in December 2021, on which a total of 112 live seed and spat, and 148 dead seed/spat were observed.

Oyster Cultch Plant and Broodreef Projects

In September 2021, LDWF completed the construction of an oyster reef in Sister (Caillou) Lake to increase oyster habitat and fisheries production. The construction process, known as cultch planting, is a proven habitat improvement technique used by LDWF and consisted of spreading approximately 29,500 cubic yards of crushed limestone on the lake bottom to create estimated 200 acres of artificial oyster reef.

In December 2021, LDWF completed construction of four broodstock reefs located at Petit Pass, Karako Bay, Lake Machias, and Mozambique Point in Plaquemines and St. Bernard Parishes. The objective of the brood reefs is to establish protected (oyster harvest is prohibited) spawning stock reef network that can help repopulate surrounding areas, including public oyster harvest areas and private leases. Approximately 5,000 cubic yards of limestone was placed within 10-

acre sitesites at each location for a total of about 20,000 cubic yards of new oyster reef.During material deposition, emphasis was placed on creating off-bottom relief.

In October 2021, LDWF completed a water bottom assessment survey of three areas totaling approximatelyalmost 900 acres in Drum Bay (St. Bernard Parish, Louisiana) to idenitify existing oyster reefs, characterize bottom types, and assist in the planning andof future restoration projects, such as placement of a cultch plant project scheduled for construction in Spring 2022.

All reef construction and water bottom assessment projects were funded through Deepwater Horizon Natural Resource Damage Assessment (DWH NRDA) settlement dollars to help restore for injuries to oysters that occurred as a result of the spill. The Louisiana Trustee Implementation Group (LA TIG) approved 26 million dollars in oyster projects, including enhancing oyster recovery using brood reefs, cultch-plant oyster restoration, and hatchery-based oyster restoration.

These oyster projects are among the first projects included in the Department's "Louisiana Oyster Management and Rehabilitation Strategic Plan" to be initiated. A copy of the plan can be viewed here:

https://www.wlf.louisiana.gov/assets/Resources/Publications/Oyster/Final-Draft---Oyster-Strategic-Plan---12.30.20.pdf

LDWF will monitor the performance of the reefs through regularly scheduled sampling events.

Boating and Non-Boating Access Projects

LDWF has several new and ongoing boating and fishing access projects, which are funded through the Sport Fish Restoration Program and administered by local entities. LDWF accepts project proposals on an annual basis and evaluates them based on ranking criteria and available funding. Current projects include:

- St. Tammany Fishing Pier – construction is completed
- New Iberia Boat Slips Boating Infrastructure Grant Program – construction is completed
- City of New Iberia CVA Sanitation Facility – design phase
- City of New Iberia Civic Center Marina Phase I – construction phase
- Marina Del Ray Renovations – permitting phase
- City of New Iberia Civic Center Marina Phase II – design phase
- Town of Leonville Boat Launch Improvements – design phase
- Town of Madisonville Boat Launch Improvements – construction phase
- Bucktown Harbor Marina and Dock Renovation – permitting phase

Additional boating and fishing access projects were recently approved by the Louisiana Trustee Implementation Group for funding from the *Deepwater Horizon* oil spill and are currently being designed and implemented.

Repairs are underway at existing and ongoing projects to address damage resulting from Hurricane Ida.

Seafood Industry Professionalism

LDWF seeks to give the state's seafood industry access and training to the latest trends, requirements, and technology in their profession, as expert training will yield higher quality products and give the seafood community a competitive advantage in the marketplace. Since the launch of Louisiana Fisheries Forward: Advancing Our Seafood Industry, this one-of-a-kind professionalism program for Louisiana's commercial fishing industry has received inquiry, acknowledgement, and recognition throughout many facets of local, regional, national and global fishing industries.

The Louisiana Fisheries Forward (LFF) contract concluded at the end of the 2021 calendar year but during this final period, an alligator industry whiteboard video was developed. To date the alligator initiative has included an industry overview report and a study on the best management practices handling wild alligator meat along with corresponding educational alligator fact sheets.

Additionally, LFF released a preliminary report characterizing the bycatch encountered by gear type in Louisiana's black drum and sheepshead fisheries. This preliminary report is scheduled to be finalized once data from additional commercial fishing trips can be obtained.

Aquatic Plant Control

Invasive aquatic vegetation continues to threaten access and recreational activities throughout Louisiana. Fall surveys conducted from November – December 2021 revealed an estimated 193,917 acres of nuisance aquatic plant coverage, mostly composed of water hyacinth (52,275 acres) and giant salvinia (32,733 acres). Fall surveys are conducted at the end of the growing season and usually reflect higher coverage than spring surveys conducted at the beginning of the growing season. From July 1, 2021 through December 31, 2021, LDWF applied EPA-approved herbicides to 12,593 acres of nuisance vegetation across the state. The majority of plant control efforts focused on giant salvinia and water hyacinth, with 5,767 and 4,441 acres treated, respectively.

Winter temperatures and isolated flood events have the potential to be major factors in determining the severity of aquatic vegetation impacts, especially giant salvinia, in Louisiana. A significant freeze event in February 2021, for the duration of several days, provided excellent control of aquatic vegetation throughout the state. Impacts from this event lasted throughout the growing season, and is evident in our most recent aquatic weed estimates. Vegetation assessments will be made again in the spring, and early season herbicide applications will be scheduled accordingly.

Giant salvinia weevils continue to provide excellent control of the exotic weed throughout south Louisiana. Established populations of the weevil are present throughout coastal Louisiana, and have significantly reduced the need for herbicide applications to giant salvinia in those areas. Established populations have also been found this year in waterbodies where the weevils had previously been unable to survive. Iatt Lake, Black-Clear Lake, and the Larto-Saline Complex have all benefited from what appears to be established, surviving weevil populations. The presence of high weevil numbers in these lakes is resulting in thinner mats, less biomass, and less overall coverage of giant salvinia in some cases. Weevil populations in these and other lakes are being monitored regularly to track survival from year to year.

Gulf States Marine Fisheries Commission
72nd Annual Spring Meeting
Technical Coordinating Committee
Wednesday, 16 March 2022
Panama City Beach, Florida

1. Emerging Issues Pertinent to Gulf of Mexico Fisheries.

Proposed Regulatory Changes/Proposals

Statewide Recreational Fishing

Spotted Seatrout Harvest Rules - Recommended adoption of proposed changes (adopted by the TPW Commission at the January 2022 meeting, effective March 16, 2022 – August 31, 2023).

- The new rule changes bag, possession, and length limits for spotted seatrout and mirrors those imposed by the emergency rule (minimum length limit of 17 inches, maximum length limit of 23 inches, possession limit of three fish) over a larger geographical area and specifies a date certain of August 31, 2023 for those limits to expire, at which time the harvest regulations would revert to the previous limits.

Oyster Management Strategies Update - Briefing

- Texas Parks and Wildlife Department (TPWD) staff briefed the Texas Parks and Wildlife Commission on the current status of the oyster fishery. The briefing included a summary of recent public concerns and potential management strategies that are currently being evaluated.
- Closure of Oyster Reef Areas - Request Permission to Publish Proposed Changes in the Texas Register. The proposed amendment would permanently close reefs in Ayres, Mesquite, and Carlos Bays to harvest.

Oyster Updates

Commercial Oyster Mariculture (COM) Update

In 2019, the 86th Texas Legislature authorized the Texas Parks and Wildlife Commission (TPWC) to create a Texas Oyster Mariculture Program. The TPWC adopted rules in May 2020, and the department continued work to develop the permitting system and guidelines and began accepting mariculture applications in the fall of 2020. Significant program developments include:

- Working with Texas Sea Grant to provide public trainings on the oyster mariculture permitting process.
- Working with Texas Sea Grant to develop an online permitting flowchart that will be available on Sea Grant's website to help the public navigate the permitting process.
- Continued refinement of program processes, procedures, guidance documents, application forms and online resources including an online permitting portal.

- Continued coordination with other state and federal agencies regarding required permits for various aspects of the program, specifically regarding changes in response to the renewal of the NWP 48 General Conditions.

- Refined biosecurity protocols for the importation of out-of-state oyster seed as well as production of oysters at in-state hatcheries to protect wild oyster genetics.

- Development of an oyster hatchery permitting and oversight process.

- Refining the standardized permit application and natural resource survey protocol to ensure no negative impacts to natural resources.

- Coordinating with the General Land Office to host GIS shapefiles as web services for creation of an online Spatial Planning Tool that allows for the visualization of the user conflicts and natural resources around the proposed site.

There are currently three permitted sites (1 conditional) as of February 2022 (Table 1); however, there are twelve additional prospective applicants that are being considered.

Table 1. Permitted Texas Commercial Oyster Mariculture applicants.

Applicant	Date application received	Applied acreage	Shellfish area	Area	Status	Permit Date
Oyster Company, LLC	1/14/2021	8	TX-32	Copano Bay	Permitted	7/26/2021
Texas Sustainable Oysters, LLC	1/11/2021	9.74	TX-1	East Galveston Bay	Permitted	9/24/2021
David Aparicio	9/1/2021	5	TX-14	Tres Palacios Bay in Matagorda Bay System	Conditional Permit	11/8/2021

Oyster Reef Habitat Mapping

The Department's Habitat Assessment team has finished mapping oyster habitat in Lavaca and Tres Palacios Bays using bathymetric side-scan sonar and will be mapping oyster reefs in Aransas Bay this year (2022).

Oyster Reef Restoration (Non-HB51)

Texas Parks and Wildlife has restored over 580 acres of oyster reef coastwide. The following was primarily funded using Hurricane Harvey Fisheries Disaster Declaration grant.

- 35 Acres on Dollar Reef in Galveston Bay in 2021

- 2 Acres of Pepper Grove Reef in Galveston Bay in 2021
- 25 acres on Keller Reef in Matagorda Bay in 2021
- 34 acres on Grass Island reef in Aransas Bay in 2020
- 15 acres on Sabine Reef in 2020

Oyster Shell Recovery

HB51 (85th Legislative Session, 2017) included a requirement that dealers purchasing oysters harvested from Texas bay systems return 30%, by volume, of the total quantity of oysters harvested during the previous license year. In lieu of returning this cultch back to public oyster reefs, dealers can pay the department a sack fee that will allow the department to return an equivalent amount to public reefs. The current amount of this fee per sack is $1.32 (has not been increased). Since 2018, 3,383,661 sacks were harvested, which converts to $4,466,431 in fees or 58,743.78 cu yds of cultch. So far, $1,067,943 in fees and 35,666 cubic yards of cultch have been placed in the bays by oyster dealers. Out of all the required payments, 61% have been with cultch and 24% has been through monetary payments (Table 2).

Table 2. Summary of Oyster Shell Recovery program (LY2018-2022)

				Final Disposition			**Total paid if cultch and fee added**	
LY (Sep-Aug)	**Sacks Harvested**	**Cultch Due (cu yds)**	**Fee in lieu of cultch**	**Cultch (cu yds)**	**Fee ($)**	**% accounted for**	**cultch**	**fee**
2018	564,787	9,805.30	$745,518	6,590.60	$248,448	100.5		
2019	754,565	13,100.00	$996,025	9,705.30	$228,047	97.0		
2020	878,503	15,251.70	$1,159,624	3,220.00	$298,329	46.8		
2021	861,939	14,964.12	$1,137,759	16,150.20	$200,438	125.5		
2022	323,867	5,622.65	$427,504	0	$92,681	21.7		
Total	**3,383,661**	**58,743.78**	**$4,466,431**	**35,666.10**	**$1,067,943**	**84.6**	**49,712.0**	**$3,779,725**
Balance (as of 2/10/2022)		**9,031.8**	**$686,706**	60.7%	23.9%			

Texas Oyster Landings

Commercial oyster landings (public and private reefs) in Texas have been variable over the last 20 years (license years, Sep-Aug); however, after a low point in harvest in 2016 of 315,424 sacks, landings have increased significantly to a recent peak in 2020 of 861,967 sacks. A similar harvest was reported in 2021 (Figure 1). This increase in landings occurred despite a decrease in the sack limit from 50 to 30 sacks and limiting fishing to only weekdays. A factor that appears to be related to the increase in harvest is the increase in active oyster vessels fishing over those same periods, with only 302 oyster vessels fishing in 2016 then increasing to 486 vessels fishing in 2020 (Figure 2). There is a moratorium on new licenses, but inactive (not fished) licenses have been transferred

to license holders that are actively fishing. The 2022 season has had similarly high harvest rates to the last several years when comparing the first 60 days of the season (Nov-Dec; Figure 3). However, our management teams have been closely monitoring reefs in our public harvest areas using Targeted Oyster Sampling (TOS) with dredges to determine if Market Oyster CPUE and % undersized oyster thresholds for closing reef areas have been met. Over the course of this season many of our reef areas were found to have fallen below the CPUE and % undersized levels that would necessitate a closure of those areas. As of February, only a few bays remain open to harvest based on our closure thresholds (but are closed off/on due to rainfall; https://www.dshs.state.tx.us/seafood/shellfish-status.aspx), and it is likely that season harvest levels will fall well below what has been seen in recent years. There was some indication that flood events in July may have contributed to some oyster mortality on the reefs, which may have reduced the market oysters available to a recently growing fleet of oyster vessels.

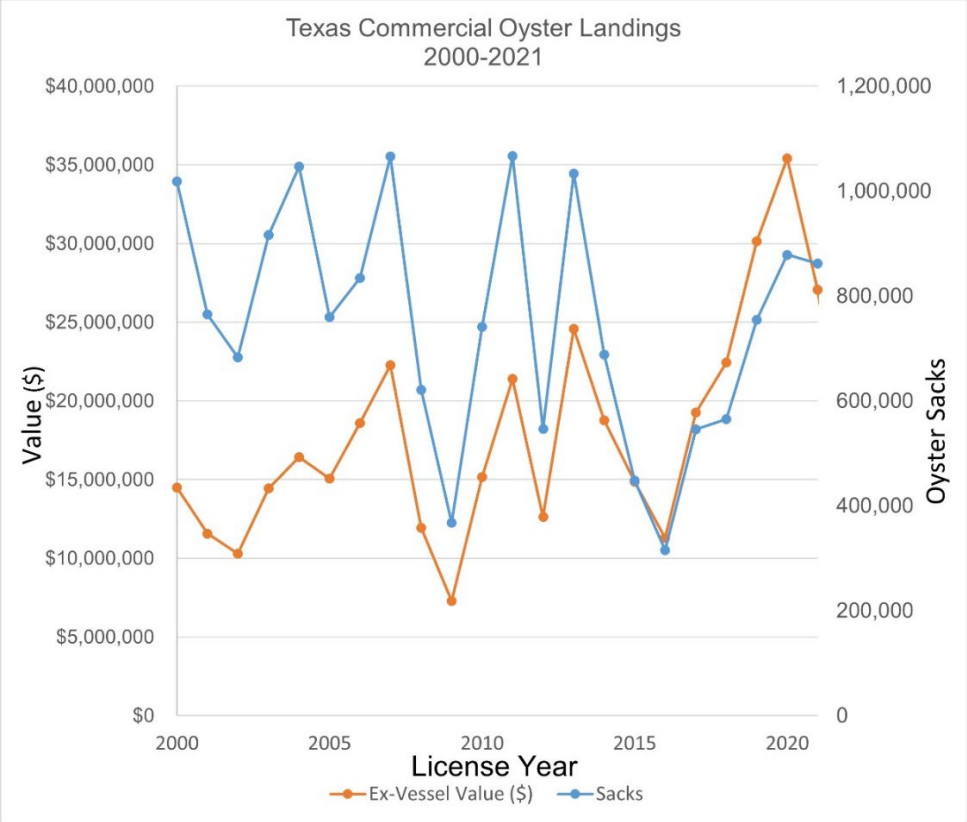

Figure 1. Texas commercial oyster harvest from 2000 to 2021 license years (Sep-Aug).

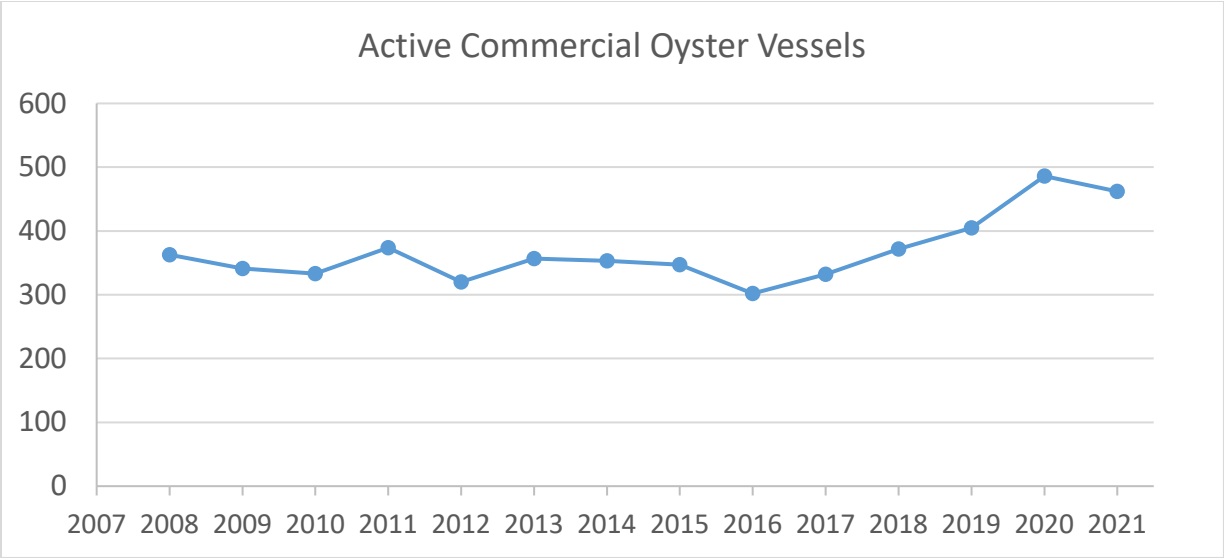

Figure 2. Active oyster vessels (reported on Trip Tickets).

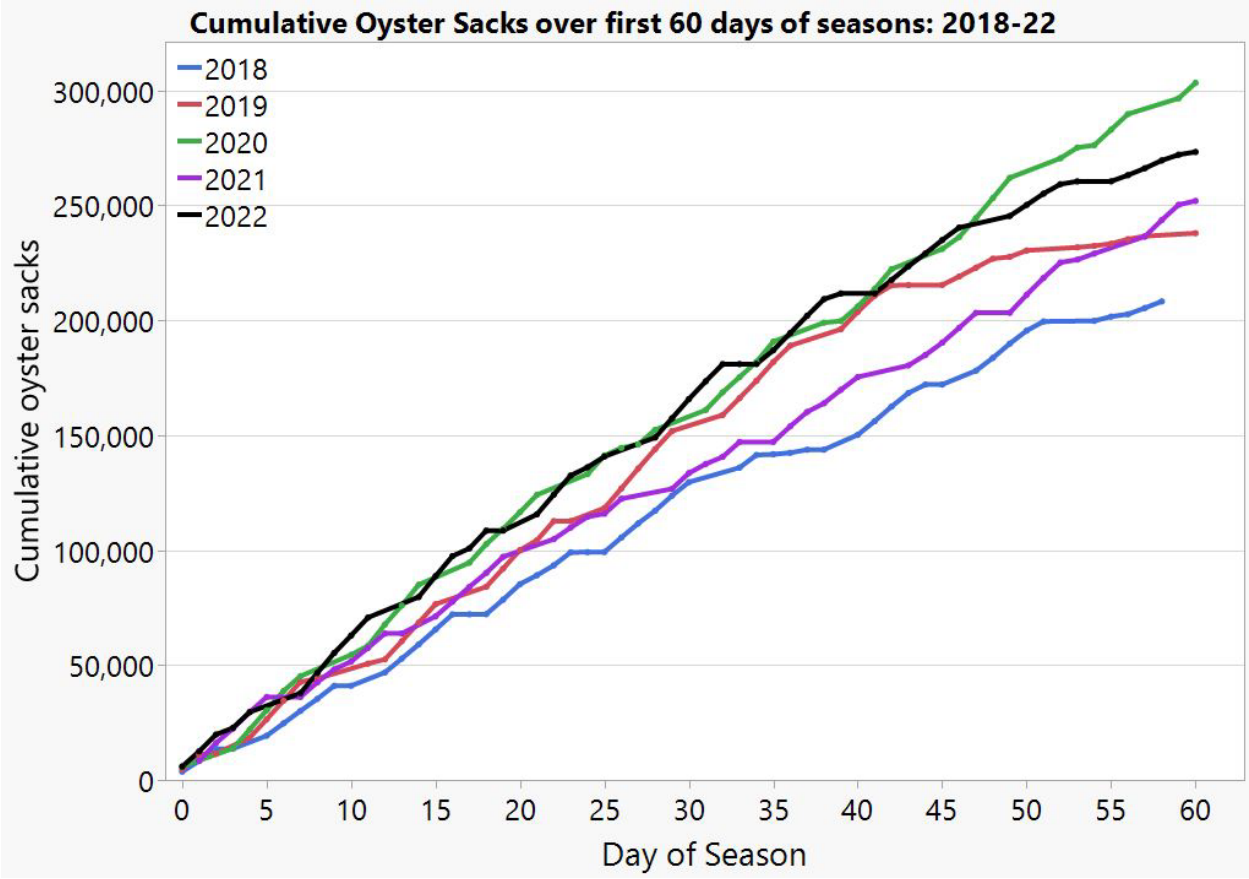

Figure 3. Cumulative number of sacks collected by the Texas oyster industry during the first 60 days (Nov-Dec) of the last 5 years of the public season.

Southern Flounder

The Southern Flounder is highly sought after in both the recreational and commercial fisheries in Texas. TPWD fishery-independent catch rate data show pronounced long-term declining trends in all life stages, from juvenile recruits to adults. For example, recent gill net survey data showed decreases in catch rates of 60% or greater compared to historic long-term trends (Figure 4).

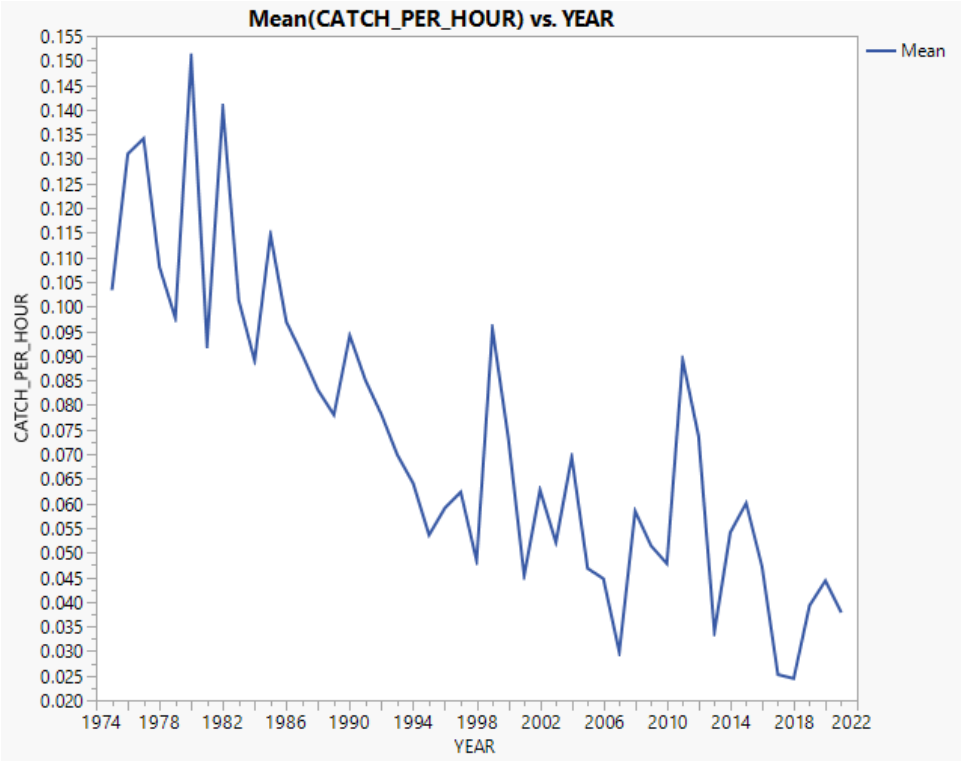

Figure 4. Gill net catch rates (catch/hour) of Southern Flounder (Fall season 1975-2021).

Based on these long-term downward trends in abundance and declining commercial (Figure 5) and recreational landings, the Texas Parks and Wildlife Commission approved regulation changes in May 2020 designed to increase spawning biomass. The change in the increased minimum length limit from 14 inches to 15 inches was implemented on September 1, 2020, and the second part of the action closed the season for both commercial and recreational harvest from November 1 - December 14 each year beginning on Sept. 1, 2021. The combination of these rules should allow more females to reach sexual maturity prior to being harvested and increase escapement of females to the Gulf for spawning, therefore increasing recruitment. The full benefit from these regulations will take a generation (approximately 6 years) to be realized.

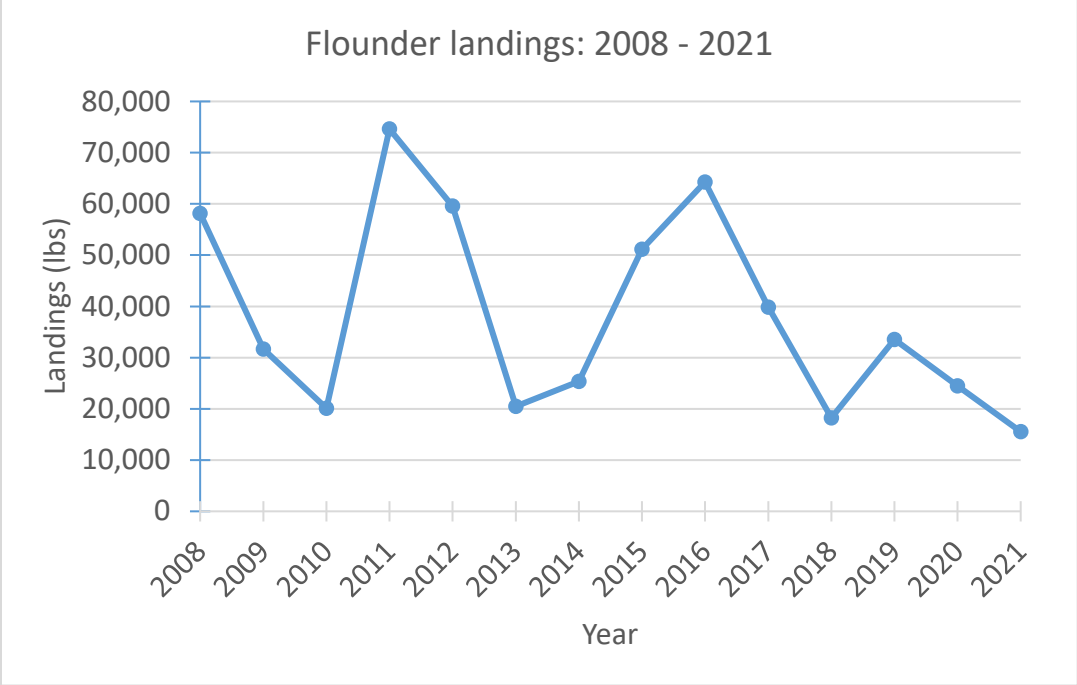

Figure 5. Texas commercial flounder landings (Trip Tickets) from 2008-2021.

Spotted Seatrout

Following winter storm Uri (Feb 14, 2021) a decline in the coastwide catch rate for Spotted Seatrout was observed in both spring and fall gill net sampling periods as compared to long-term trends from TPWD's fisheries independent monitoring program (Figures 6 and 7). The most noteworthy declines were in bays and estuaries on the middle and southern coast of Texas. Therefore, a proposal was presented to the Texas Parks and Wildlife Commission to adopt a temporary, two-year reduction in daily bag limit and change in the slot size limit to help the species recover from the freeze. The proposal mirrored the emergency Spotted Seatrout regulation for the Laguna Madre that was effective 4/1/2021 - 9/27/2021. This rule will include all coastal waters from the Rio Grande northward to Highway FM 457 in Sargent, excluding Galveston Bay and Sabine Lake. This proposal was approved by the Texas Parks and Wildlife Commission (TPWC) during the January 2022 meeting and will go into effect beginning March 16, 2022 and expire August 31 of 2023.

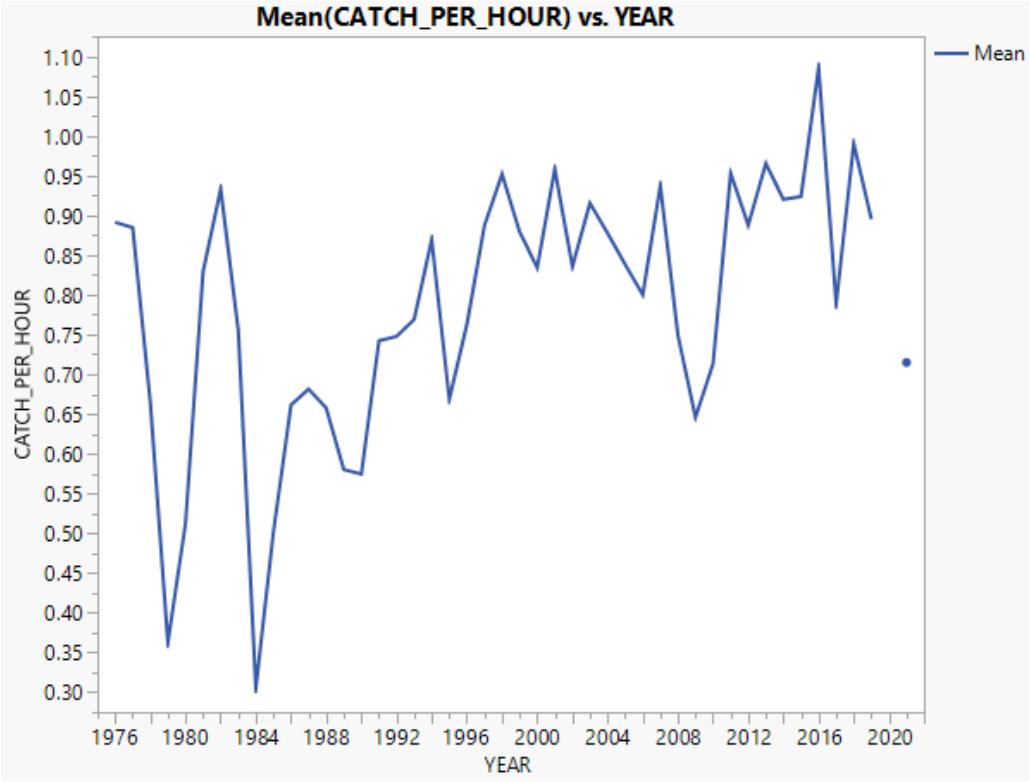

Figure 6. Catch per hour of Spotted Seatrout from Spring gillnets. 2020 data were not collected due to COVID restrictions. 2021 data are represented by the single dot.

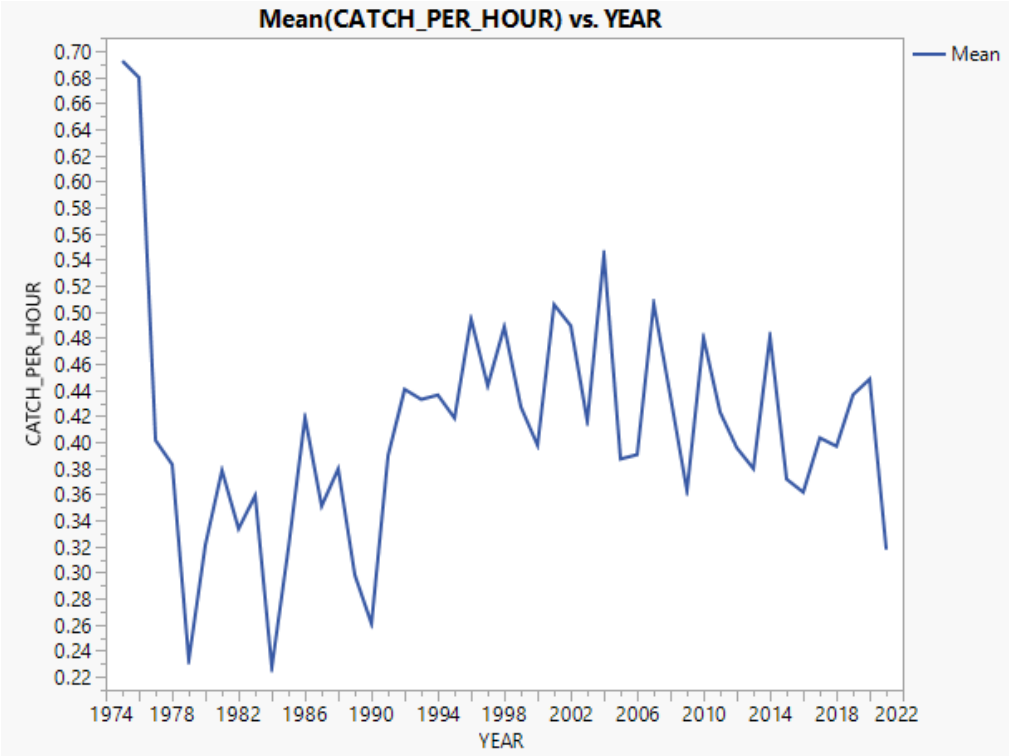

Figure 7. Catch per hour of Spotted Seatrout from Fall 2021.

CARES Act Updates

CARES Act funding notification letters were sent out to qualified license holders in February 2021. They could apply for losses within three separate sectors: Commercial Fishery Participant, Wholesale Seafood/Bait Dealer, and for-hire/guide. In the first round, Texas was given (after admin expenses) $8,968,805 to cover losses within these sectors (64.3 % for Commercial Fishery, 25.1% for Seafood Dealers, and 10.6% for For-Hire sector). Additionally, Texas received $7,534,853 in second round funding at the same allocation proportions (total of $16,503,658 for both rounds). We received 456 applications across all three sectors and approved 136 applications. For the first round of applications, each qualified applicant was able to get 100% of losses covered, and total approved distributions in the first round totaled $9,899,168 (Table 3). After distributions of Round 1 (and partial Round 2) funds, Texas had $6,604,490 remaining.

Some applicants claimed they did not receive notification of their initial denial and chance to appeal. In addition, we had a number of applicants that would have qualified with greater than a 35% loss based on their income as provided on their initial application (but did not appeal for some reason). Since Texas had significant funds remaining and the low initial approvals in some sectors, we opened up a second chance appeals period for those that would have met a greater than 35% loss based on their income in the initial application. Letters of this funding opportunity were sent out by certified mail on February 1, 2022, and applicants were given 14-business days to submit required documents. In all, 85 applicants were given this second chance and sent letters (2 for-hire guides, 79 fishery participants, and 4 seafood dealers). We are currently receiving documents for sector appeals.

Table 3. Summary of Texas CARES Act applications and funding distribution.

Sector	NOAA Allocation Proportions	First Round Funds	Second Round Funds	Total funds	# applicants	# approved	Approved distributions
Commercial Fishing	64.3	$5,766,942	$4,844,910	$10,611,852	322	37	$4,320,889
Seafood Dealers	25.1	$2,251,170	$1,891,248	$4,142,418	17	5	$3,532,436
Recreational For-Hire	10.6	$950,693	$798,694	$1,749,387	116	94	$2,045,843
All Sectors	**100**	**$8,968,805**	**$7,534,853**	**$16,503,658**	**456**	**136**	**$9,899,168**

2. Activities Related to Artificial Reef Programs.

Rigs-to-Reefs

Table 4. Rigs-to-Reefs sites, donations, and deployment dates

Structure	Reef Site	Platform Size	Donor	Donation Amount	Deployment Date
HI-A-537 B	HI-A-555	8-pile	Freeport McMoRan	$300,000	09/26/21
HI-A-536 C	HI-A-555	8-pile	Freeport McMoRan	$300,000	10/01/21
HI-A-446 A	HI-A-466	8-pile	Fieldwood Energy	$180,000	10/08/21

- Three 8-pile platforms owned by Freeport McMoRan Oil & Gas and awaiting deployment at HI-A-555 (2 structures) and HI-A-330 (1 structure). Each structure's donation agreement was finalized at $300,000.
- Currently, there are 3 platform donations in negotiation, including the Exxon-Mobile Hoover Spar.

Ships-to-Reefs

- *No updates at this time*

Nearshore Reefs

- Memorial Reefs, Inc. deployed 3 reef balls at Barr's Reef on September 27th. Memorial Reefs, Inc. is based out of Hawaii and has deployments internationally. This was their first deployment in Texas waters, and we look forward to working with them again.

- Laredo Construction LLC, in partnership with Atlantis Marine Habitats, was awarded the reefing contract for Big Man's, Kate's and Sabine Nearshore Reefs. The contract will place 1,150 pyramids and 255 low relief plates at the reefs with a total cost of $2.7m. Most of the funding is coming from Hurricane mitigation funds, with an additional $559,000 from CCA. Laredo began deployment of the reef materials in early December. All 150 pyramids for the Sabine HI-20 nearshore reef site and the 500 pyramids for the Big Man's reef site were deployed by 16 December 2021. Deployments at Kate's reef site of both pyramids and reef plates should be completed before the end of February.

Grants / Administration

- The Artificial Reef Program was awarded funding for a project under the Texas Coastal Management Program (CMP) Grant Cycle 26. This funding will allow for the deployment of 100 pyramids and 100 low-relief reef plates at the Sabine Nearshore Reef Site (HI-20). Staff are working with the contracting and purchasing division to amend the contract with Laredo Construction, Inc. for the additional structures. The ARP anticipates the deployment of new nearshore materials in the Sabine nearshore reef site in Spring 2022.
- The GLO Asset Removal team and the ARP finalized the plan for the removal of the old Queen Isabella Causeway off Port Isabel/South Padre Island. The GLO has ownership of the bridge and it must be removed at some point soon. Estimates show that it may require $10-12m for removal (and reefing). A contract between the GLO and the ARP will allow for the ARP to oversee and carry out the required archeology survey for a new reef site. The contracted vendor, SEARCH, Inc., has received the antiquities permit from the Texas Historical Commission and but weather conditions kept the survey from occurring.

However, SEARCH has found a larger vessel that should be able to negotiate the winter seas and the survey is currently set for mid-February.

3. Activities Associated with the Gulf of Mexico Crab Fisheries.

Abandoned Crab Trap Removal Program

The Texas Parks and Wildlife Department (TPWD) closed state waters to crabbing (with crab traps) 10 consecutive days beginning February 18, 2022. During this time, crab traps encountered are classified as "abandoned" and may be removed by Law Enforcement personnel, Department staff, and any member of the general public. Updates on total traps removed will be provided in the Fall, 2022 report.

Blue Crab Updates

Blue crab trends in Texas remain relatively unchanged from last year's report. Based on TPWD fishery independent catch rates, coastwide relative abundance of blue crabs has shown significant declines since the 1980's. This trend is generally consistent in all Texas bays. While these trends have largely stabilized since the early 2010's, and gill net surveys suggest increased catch rates of adult blue crabs in recent years (Figure 8), bag seine and bay trawl catch-rates (Figure 9 and 10, respectively) suggest that juvenile abundance continues to remain low. Further analysis of this data suggests that juvenile mortality is increasing and thus the population is not seeing an overall increase in abundance.

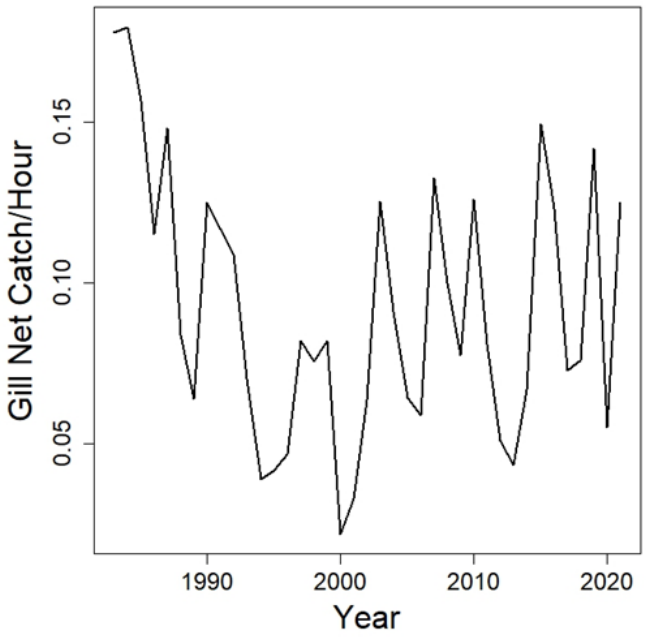

Figure 8. Blue crab catch rate in fishery independent gill net surveys conducted in Texas bays. Note, gill net samples were not collected during the spring of 2020 due to the COVID-19 pandemic (i.e., 2020 consists of only fall gill net samples).

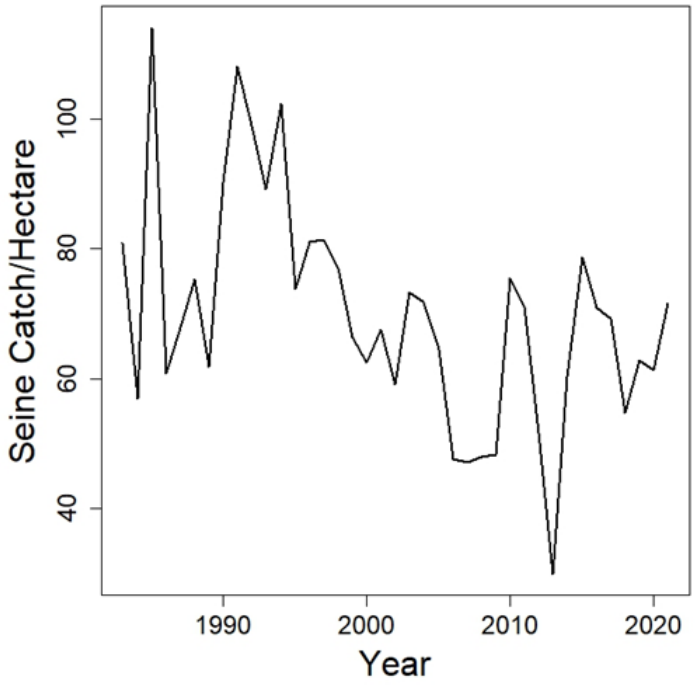

Figure 9. Blue crab catch rate in fisheries independent bag seine surveys conducted in Texas bays.

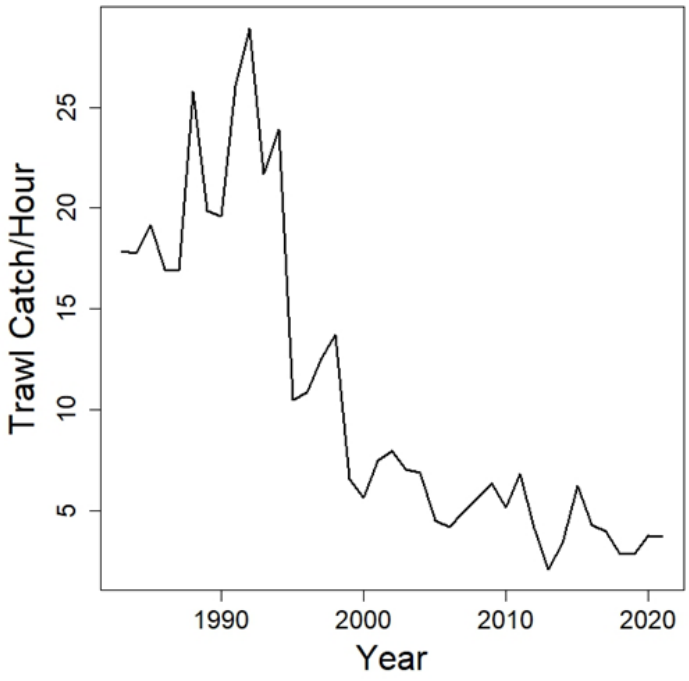

Figure 10. Blue crab catch rate in fisheries independent bay trawl surveys conducted in Texas bays.

Commercial Landings

Total commercial landings of blue crab have significantly declined since the 1980's. This is, in part, due to commercial license buy-back that began in the late-1990's. The 2021 landings continue that slight downward trend (Figure 11); in 2021, total landings of blue crab in Texas were 3,341,709 lbs. which is 41% lower than the 37-year annual average of 5,672,167 lbs; however, 2021 landings are only a 3 and 8% decrease over the 10 and 20-yr average landings.

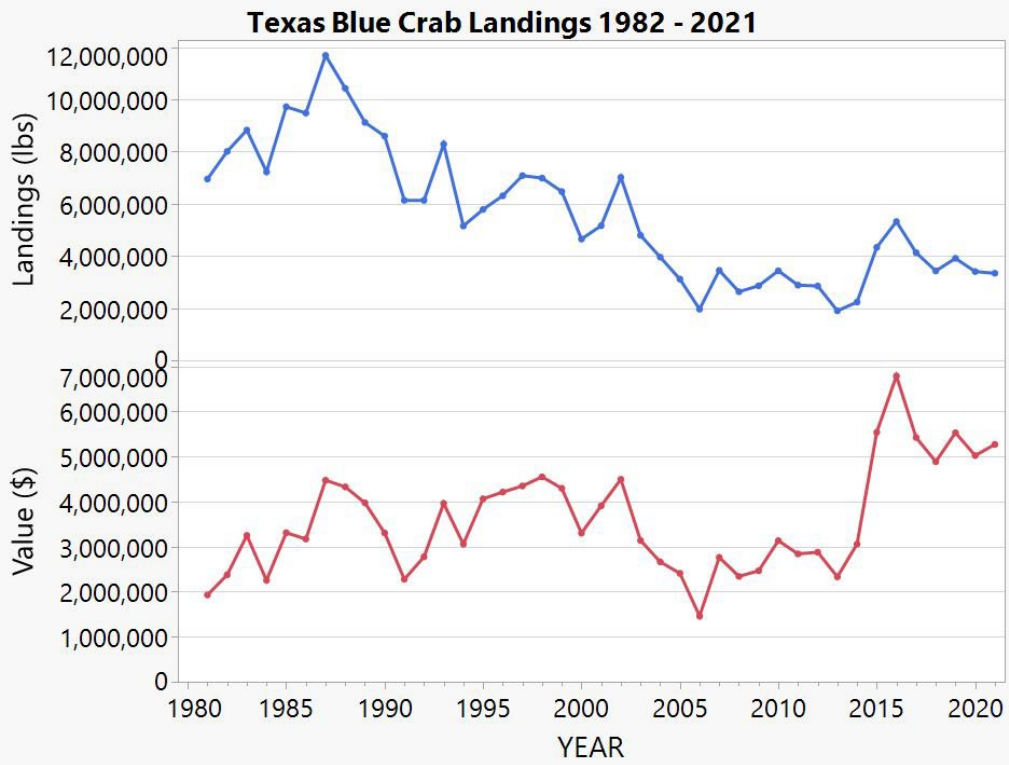

Figure 11. Total annual landings and value of blue crab in Texas.

4. Activities Related to Fisheries Dependent Data Collection.

Texas Trip Ticket Program

Trip ticket staff have continued to work with BlueFin software developers to improve the production version of the VESL web-based Trip Ticket System. As of February 2022, we have 202 dealers (out of 313 current) using the new VESL system, including new dealers and previous electronic and paper dealers. There are still 27 dealers using the original electronic program and 84 dealers using paper tickets. We continue to move dealers from the original electronic program to VESL and try to persuade paper dealers to switch. So far, we have received positive feedback from these dealers on the new system. We continue to work with our programmers and dealers to address any issues. The main advantages of the new system are the ease of access (web-based mobile devices can be used) and that we have added many validation steps to improve the accuracy of vessel, fisherman and dealer license data. In 2022, VESL was still being updated

(developed with BlueFin programmers) to allow for federally permitted seafood dealers to report. They currently report via the original electronic program.

Fishery-Dependent harvest data collection (creel surveys)

During the Texas Parks and Wildlife Department's 2020-21 creel survey year (15 May 2020 through 14 May 2021), 1,108 surveys were conducted at boat-access sites along the coast.

For private-boat bay-pass anglers, an estimated 5,895,300 man-hours were expended to harvest an estimated 1,364,600 fishes. Staff conducted 12,668 target interviews involving 32,233 anglers. Of the 56 species encountered, Spotted Seatrout, Red Drum, and Atlantic Croaker were most frequently landed. Mean party size was 2.5 people and mean trip length was 5.6 hours. Staff observed 38,299 fishes and measured the length for 28,896 of them.

For private-boat Texas Territorial Sea anglers, an estimated 133,800 man-hours were expended to harvest an estimated 33,700 fishes. Staff conducted 498 target interviews involving 1,429 anglers. Of the 41 species encountered, Red Snapper, King Mackerel, and Spotted Seatrout were most frequently landed. Mean party size was 2.9 people and mean trip length was 6.3 hours. Staff observed 2,266 fishes and measured the length for 1,565 of them.

For private-boat Exclusive Economic Zone anglers, an estimated 129,600 man-hours were expended to harvest an estimated 28,300 fishes. Staff conducted 319 target interviews involving 1,240 anglers. Of the 36 species encountered, Red Snapper and King Mackerel were most frequently landed. Mean party size was 3.9 people and mean trip length was 7.7 hours. Staff observed 1,954 fishes and measured the length for 1,343 of them.

Fishery-dependent collection of otoliths for the Gulf States Biosampling program

We started a new agreement with the GSMFC biosampling program to collect otoliths from select species, starting in September 2021 (Table 5). Otoliths are being collected from recreational anglers and aged via independent contractors paid by GSMFC. To date, the following samples have been processed at our facility:

Table 5. Summary of otoliths collected from recreational species at boat ramps for Gulf States Biosampling program.

Common Name	Scientific Name	Processed	Requested
Gray Snapper	*Lutjanus griseus*	0	75
Vermillion Snapper	*Rhomboplites aurorubens*	24	170
Red Snapper	*Lutjanus campechanus*	19	400
Triggerfish	*Balistes capriscus*	0	50
King Mackerel	*Scomberomorus cavalla*	1	300
Sheepshead	*Archosargus probatocephalus*	55	70
Southern Flounder	*Paralichthys lethostigma*	17	100
Black Drum	*Pogonias cromis*	155	340
Red Drum	*Sciaenops ocellatus*	216	750
Spotted Seatrout	*Cynoscion nebulosus*	384	1500

iSnapper – mobile reporting app

iSnapper will continue to be promoted through 2022. Both TPWD and TAMUCC creel surveys will be used to validate reporting in *iSnapper*, and to use for calculating estimates through the (non-mandatory) app reporting system.

5. Activities Related to Fisheries-Independent Sampling.

SEAMAP

Bottom longline and Vertical line sampling

2021 SEAMAP operations were completed last October. We are planning to upgrade the longline winch on the R/V Nueces, which covers the mid-Texas coastal area.

All 60 vertical longline stations were completed across all three depth strata and over 3 stat zones off Texas (Table 6). In 2021, 383 fish were caught, and out of the 8 different species caught, Red Snapper made up 90.6% of the catch composition. In 2021, the majority of stations had positive catches of Red Snapper (72.7-85.7% of stations), with the 10-20 zone having the greatest % of stations with snapper. This is strikingly different than previous years, as this stratum is usually the lowest % of stations, but is likely due to the inclusion (and selection) of more stations within this stratum in stat zone 21, which tends to have more snapper in shallow water. However, as usual, higher CPUEs of Red Snapper were encountered in the deeper two depth strata (19.8-20.4 RS/100 hks vs only 12.4 RS/100 hks in the shallow stratum; Table 6).

Table 6. Summary of Red Snapper catch from SEAMAP Vertical Line Survey sampling from 2017 – 2021 by depth strata (no surveys were completed in 2020 due to COVID-19).

Year	Depth Strata (m)	# of Stations	# of Hooks Fished	# of Red Snapper	Mean TL (mm)	Mean Weight (kg)	# of Stations with Red Snapper	% Stations with Red Snapper	CPUE (RS/100 hks)	Yearly CPUE (RS/100 hks)
2017	10-20	9	260	17	273	0.39	7	77.8	6.5	21.6
	20-40	18	420	140	484	1.71	16	88.9	33.3	
	40-150	32	960	198	504	1.78	29	90.6	20.6	
2018	10-20	8	240	10	262	0.27	3	37.5	4.2	18.3
	20-40	19	570	152	476	1.69	13	68.4	26.7	
	40-150	33	990	167	497	1.82	28	84.8	16.9	
2019	10-20	8	240	28	395	0.94	4	50.0	11.7	20.0
	20-40	19	570	161	457	1.44	14	73.7	28.2	
	40-150	36	1140	201	527	2.00	23	63.9	17.6	
2021	10-20	7	210	26	281	0.32	6	85.7	12.4	19.3
	20-40	20	600	119	397	1.05	16	80.0	19.8	
	40-150	33	990	202	449	1.36	24	72.7	20.4	

6. Other State Activities.

Fisheries Enhancement Program (Hatcheries)

During this fiscal year-to-date, the saltwater enhancement program has stocked 7,184,332 fingerlings in Texas' public waters (Note, most fingerlings are stocked during the summer; Table 7).

Table 7. Total Red Drum, Spotted Seatrout, and Southern Flounder fingerlings produced and stocked into various Texas water bodies during FY 2022 (9/1/2021 – 2/4/2022).

FY 2021 Water Body	Red Drum Fingerlings Stocked	Spotted Seatrout Fingerlings Stocked	Southern Flounder Fingerlings Stocked
Aransas		570,522	3,915
Corpus Christi		207,272	
East Matagorda		191,597	
Galveston		336,670	
Lower Laguna Madre		685,844	
Sabine Lake			
San Antonio	156,994	1,125,545	
West Matagorda	255,938	1,071,755	
Upper Laguna Madre	872,596	718,102	
Freshwater			
Calaveras	643,620		
Kleberg Park	3,356		
Lake Bryan			
Victor Brauning	340,606		
Total	**2,273,110**	**4,907,307**	**3,915**

License Buyback Program

There have been no Buyback rounds since last report

Perry R. Bass Marine Fisheries Research Station Updates

PRB Projects

Eastern Oyster (*Crassostrea virginica*) population genomics

This project consists of sampling oysters throughout the Gulf and generating a high resolution SNP genomic data set. Genomic sequencing of samples from Florida (n = 3), Louisiana (n = 2), Alabama (n = 1) and Texas (n = 11), has been completed. Sequencing and bioinformatics are being supported by the Marine Genomics lab at Texas A&M Corpus Christi (MGL). We have created a final variant file including nearly 20,0000 unique genomic loci that will be used for spatial genetic analysis; analysis of that data set is ongoing both at PRB and MGL.

Detection of shrimp black gill disease in wild Gulf shrimp

We are continuing work on a study on the presence and prevalence of shrimp black gill (sBG) in White (*Litopenaeus setiferus*) and Brown (*Farfantepenaeus aztecus*) Shrimp in Texas. We have identified the pathogen that seems to drive this condition in Texas, using DNA sequencing technology. In 2019, *n* = 1,605 shrimp (White and Brown Shrimp combined) were sampled and sBG detection was conducted using a PCR test coupled with lab examination/diagnosis. We are continuing and expanding our sampling effort for this project. Sampling has continued in 2020 and 2021. In an effort to assess impacts to Gulf commercial shrimping, we have partnered with Texas Agrilife Sea Grant extension and the offshore shrimp trawl fishing community to expand sampling offshore and link it directly to the industry. Sampling has now been completed and data analysis is ongoing. A paper reporting the presence and prevalence of sBG has been published in Marine and Coastal Fisheries (AFS, below).

Swinford J., and J. Anderson. ***2021****. Prevalence of black gill (Hyalophysa lynni) in white shrimp (Litopenaeus setiferus) and brown shrimp (Farfantepenaeus aztecus) along the Texas gulf coast. Marine and Coastal Fisheries. https://doi.org/10.1002/mcf2.10153*

Observation of growth in two sizes of post-release Red Drum *Sciaenops ocellatus*

We are cooperating with the TPWD stock enhancement branch to determine whether there are differences in growth and body condition between stock enhancement Red Drum that are above versus below the size targeted (35 mm) at the time of harvest. Samples of fish were collected at harvest, and individuals were fit with coded wire tags and released into wet lab tanks. Six trials have been completed (May, August, November 2020, May, August, November 2021) and data analysis is ongoing. Preliminary results suggest that fish below target have a higher mortality rate post-harvest, and there are also differences in daily growth between individuals above and below harvest targets.

Determination of hatching dates in wild Southern Flounder (*Paralichthys lethostigma*)

Young-of-the-year Southern Flounder are being collected during fishery independent sampling (TPWD). Otoliths are being extracted from all individuals and daily increment rings are being used to determine hatching dates for Southern Flounder. Hatching dates will be related back to environmental (water quality) conditions to understand spawning and hatching conditions for Southern Flounder in the wild. Daily rings are present and countable. We have also observed accessory growth centers that might be associated with metamorphosis. Additionally, a collaborative component to this project with the TPWD stock enhancement program has yielded direct comparisons of growth and metamorphosis in wild versus hatchery fish. Preliminary results of this study include (1) relative consistency in daily growth of hatchery versus wild fish, (2) temporal and regional differences in the timing of metamorphosis (and ostensibly hatch), of Southern Flounder along the Texas coastline based on reverse calculations of growth from wild-caught fish over the last 30 years, and (3) progressive changes to the timing of hatch and metamorphosis in this species over the entire time series. Data analysis complete, manuscript in review.

Taxonomic uncertainty in ladyfish (*Elops saurus versus E. smithi*) in the western Gulf of Mexico

Research conducted in the last decade described a new species of ladyfish, *Elops smithi*, which occurs in sympatry with *E. saurus* in the Gulf of Mexico. We have collected 354 ladyfish specimens

via TPWD fishery independent sampling. Morphological characters which diagnose each species have been counted and paired with mtDNA sequencing to take census of these species in Texas' waters. To date, both species have been identified in Texas, with *E. saurus* (approximately 90% of specimens) encountered more frequently than *E. smithi*. We are also using otolith increment analysis to observe age/growth parameters in *Elops sp*. Analysis is complete, manuscript in preparation.

Investigating the use of environmental DNA (eDNA) for assessing presence and abundance of marine finfish in the coastal waters of Texas

We are in year 2 of a proof-of-concept study to test the efficacy of eDNA as a sampling methodology in the various estuarine habitats in Texas. We are now testing a community-level assay (DNA metabarcoding) to detect marine species. To date, we have (1) produced a reliable Sciaenidae family-specific qPCR detection assay, (2) identified a reliable water sampling/DNA extraction protocol using Smith Root filter cups, and (3) used wet lab trials to test the efficacy of sampling, extraction, and PCR steps. We have also built a DNA sequence reference file specific to the expected community structure of Texas' estuaries. The reference consists of >700 species that are commonly encountered in TPWD CF sampling gears and references a DNA sequence locus (mtDNA cytochrome oxidase) commonly used for barcoding studies. This reference file has been tested successfully by our staff against commonly used DNA metabarcode program pipelines. Side-by-side water sampling with TPWD gill nets is anticipated in the Spring of 2022. Funding was extended to Dec. 2022 through SuRF funds (GSMFC).

Analysis of taxonomic uncertainty and field identification of snook (*Centropomus sp.*) (NEW)

In order to improve field identification of the two snook species that occur in Texas, we will pair morphological examination with genetic identification (DNA sequencing) in order to identify key characters for each species. Previous work in our lab has identified problems with using commonly employed keys to differentiate *C. undecimalis* from *C. mexicanus* in Texas. Additionally, age/growth curves generated from otoliths obtained from TPWD field-identified specimens indicate (1) 2 different growth trajectories, suggesting species-specific growth functions, and (2) data contamination of each growth function due to (presumed) misidentification in the field. For otoliths already on hand, we will explore improving taxonomic ID using species-specific differences in gross otolith morphology (i.e., fourier series shape analysis using the uncut, paired saggital otolith). Field sampling will begin in Fall of 2021 and field specimens will be used to validate otolith shape differences and further examine external morphological key characters using a number of published keys. We anticipate the following deliverables: (1) improvement of the key characters that can be used for field identification of *Centropomus* sp. in Texas, and (2) taxonomic resolution of potentially mis-identified otolith snook specimens for accurate age/growth function analysis.

Collaborative projects

Range-wide population genetic structure of Alligator Gar (*Atractosteus spatula*)

In collaboration with Dr. Brian Kreiser, (University of Southern Mississippi), we are analyzing mitochondrial DNA (mtDNA) sequence data already on hand in our lab, in an effort to examine the range-wide population structure of the species. Dr. Kreiser is analyzing a microsatellite DNA data set, and together we will attempt to compare and contrast historical versus contemporary patterns of movement and demographic exchange among drainages in the Gulf of Mexico

basin. Manuscript preparation has been completed and journal submission is anticipated in Spring of 2022.

Using population genomics to inform stock enhancement and ecosystem-based management of Spotted Seatrout *Cynoscion nebulosus*

In collaboration with Drs. Portnoy and Hollenbeck (TAMUCC) as well as TPWD hatchery staff (Mace, Fincannon, Cason) we will be collecting YOY spotted seatrout in conjunction with TPWD routine monitoring samples starting in Spring 2022 (bag seines and gill nets). The collections will serve two purposes: (1) we intend to examine genomic patterns of variation which have a spatial component (population genetics), and (2) we intend to estimate the contribution of hatchery-origin Spotted Seatrout to fish sampled in the wild. An additional deliverable of this project will be a genetic linkage map that will be generated by examining full- and half-sibling crosses from hatchery Spotted Seatrout families. This project is funded through Sea Grant and is anticipated to last through 2024.

Utilizing eDNA and plankton sampling to monitor American Eel recruitment in Texas (NEW)

In collaboration with Drs. Guillen and Oakley (U. Houston, Clear Lake) we will be using a combined eel ramp and eDNA approach to identify potential migratory routes and timing for American Eel juveniles. Eel entrapment structures (aka "eel ramps") will be located along several lower rivers in Texas spanning from the Nueces River up through several northern coast drainages (specific sample sites not yet selected). Regular checks of these ramps will coincide with eDNA water sampling. We are also partnering informally with Steven Davis (Lower Colorado River Authority) to assay similar sites in his area using eDNA methods. We have selected appropriate DNA assays and have quality controlled the lab eDNA steps and water sampling methodology. Site selection and deployment is set to roll out in Spring 2022. The intent of this project is to identify timing of Glass Eel migration into Texas river drainages. Work is supported through State Wildlife Grant funds (SWG).

Identification of a novel lineage within the Fat Snook species-complex of the genus *Centropomus* (Perciformes: Centropomidae) (NEW)

We are supporting the work of Dr. Seifu Seyoum and others (Florida FWRI), in an effort to describe the evolutionary history and population genetics of the Fat Snook complex (*C. parallelus/mexicanus*) throughout the Gulf of Mexico and northern Caribbean. The TPWD has long recognized that there might be problems with the currently described phylogeny in this group, and we have agreed to partner with Dr. Seyoum in describing some of the inconsistencies associated with DNA sequence data and lineage definitions. This is an FWRI-lead effort; our role is in provision of DNA samples from Texas Fat Snook, and we are assisting Dr. Seyoum with data analysis and manuscript preparation.

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No. 309 April 2021. Annual Report of the Fisheries Information Network in the Southeast Region (FIN). January 1, 2020 - December 31, 2020. Gulf States Marine Fisheries Commission.

No. 308 October 2021. GDAR03 Gulf Menhaden Stock Assessment – 2021 Update. Dr. Amy Schueller, Editor. Gulf Data, Assessment, and Review. Gulf States Marine Fisheries Commission.

No. 307 October 2020. SEAMAP Subcommittee Annual Report to the Technical Coordinating Committee of the Gulf States Marine Fisheries Commission October 1, 2020 to September 30, 2021. Jeffrey K. Rester, Editor. Gulf States Marine Fisheries Commission.

No. 306 August 2021. Licenses and Fees for Alabama, Florida, Louisiana, Mississippi, and Texas in Their Marine Waters for the Year 2020. Debbie McIntyre (Editor). Gulf States Marine Fisheries Commission.

No. 305 May 2021. Annual Report of the Southeast Area Monitoring and Assessment Program (SEAMAP) October 1, 2019 – September 30, 2020 (online only).

No. 304 May 2021. Law Summary 2020. A Summary of Marine Fishing Laws & Regulations for the Gulf States. Debbie McIntyre (editor). Gulf States Marine Fisheries Commission (online only).

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No. 296 March 2020. Guidelines for Marine Artificial Reef Materials, Third Edition. A Joint Publication of the Gulf and Atlantic States Marine Fisheries Commissions. James R. Ballard (Editor).

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No. 291 August 2019. Licenses and Fees for Alabama, Florida, Louisiana, Mississippi, and Texas in Their Marine Waters for the Year 2018. Debbie McIntyre (Editor). Gulf States Marine Fisheries Commission.

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First (1949-1950)
Second (1950-1951)
Third (1951-1952)
Fourth (1952-1953)
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Eighth (1956-1957)
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Fifteenth (1963-1964)
Sixteenth (1964-1965)
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Issues 18 through 25 (1966-1967 through 1973-1974) were not published
Twenty-sixth (1974-1975)
Issue 27 (1975-1976) was not published
Twenty-eighth (1976-1977)
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Thirty-third (1981-1982)
Thirty-fourth (1982-1983)
Thirty-fifth (1983-1984)
Thirty-sixth (1984-1985)
Thirty-seventh (1985-1986)
Thirty-eighth (1986-1987)
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Fortieth (1988-1989)
Forty-first (1989-1990)
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Fifty-third (2002)
Fifty-fourth (2003)
Fifty-fifth (2004)
Fifty-Sixth (2005)
Fifty-Seventh (2006)
Fifty-Eighth (2007)
Fifty-Ninth (2008)
Sixtieth (2009)
Sixty-First (2010)
Sixty-Second (2011)
Sixty-Third (2012)
Sixty-Fourth (2013)
Sixty-Fifth (2014)
Sixty-Sixth (2015)
Sixty-Seventh (2016)
Sixty-Eighth (2017)
Sixty-Ninth (2018)

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"COMPACT NEWS," a newsletter from the Gulf States Marine Fisheries Commission Staff, is edited by Nancy K. Marcellus and currently published bi-annually (April and November).

For more information on publications, please contact:
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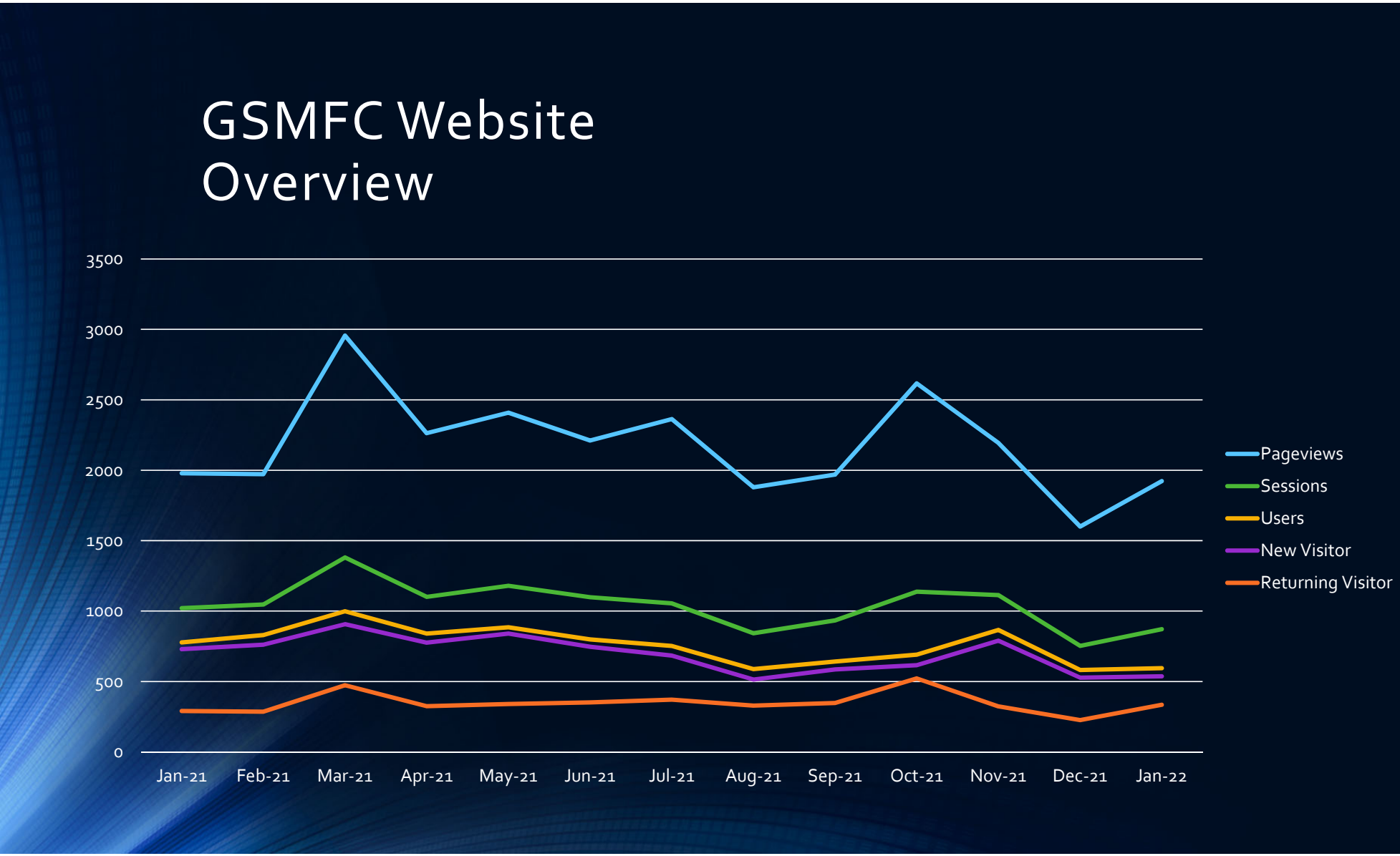

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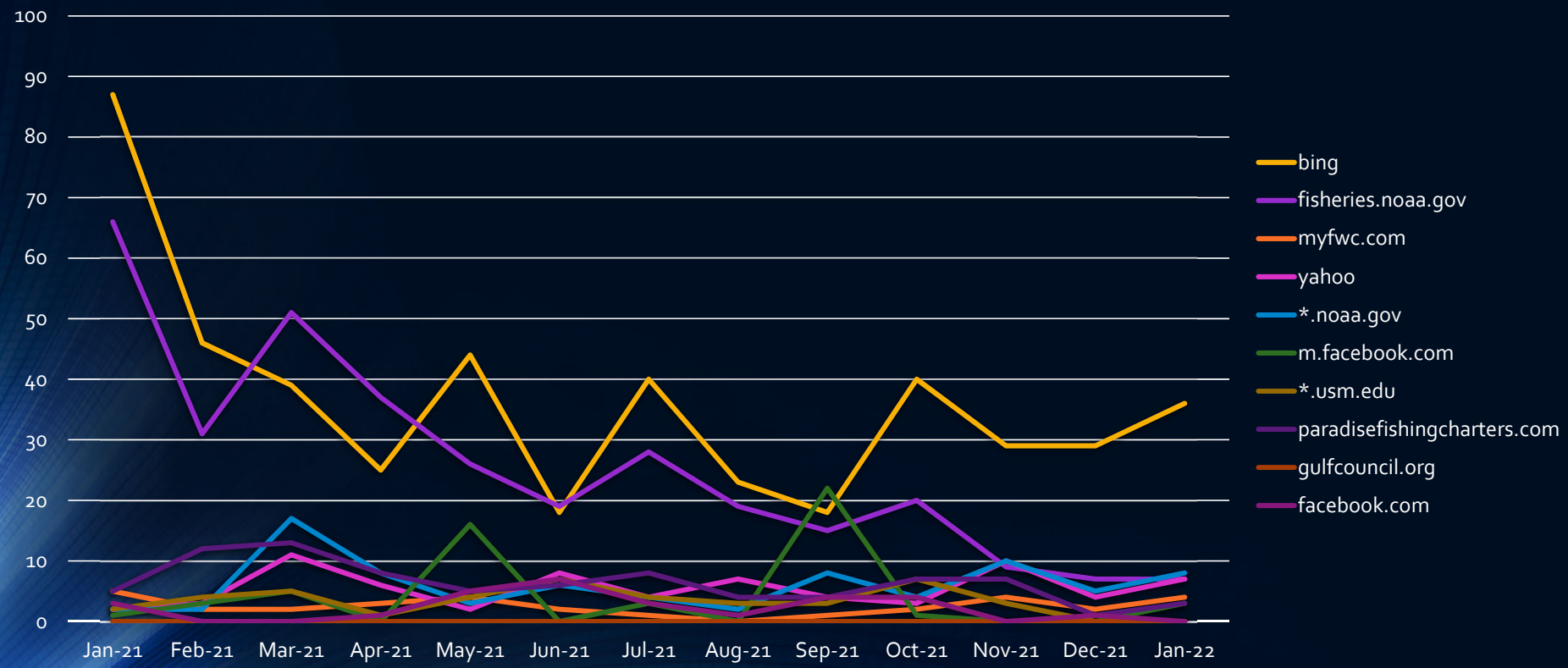

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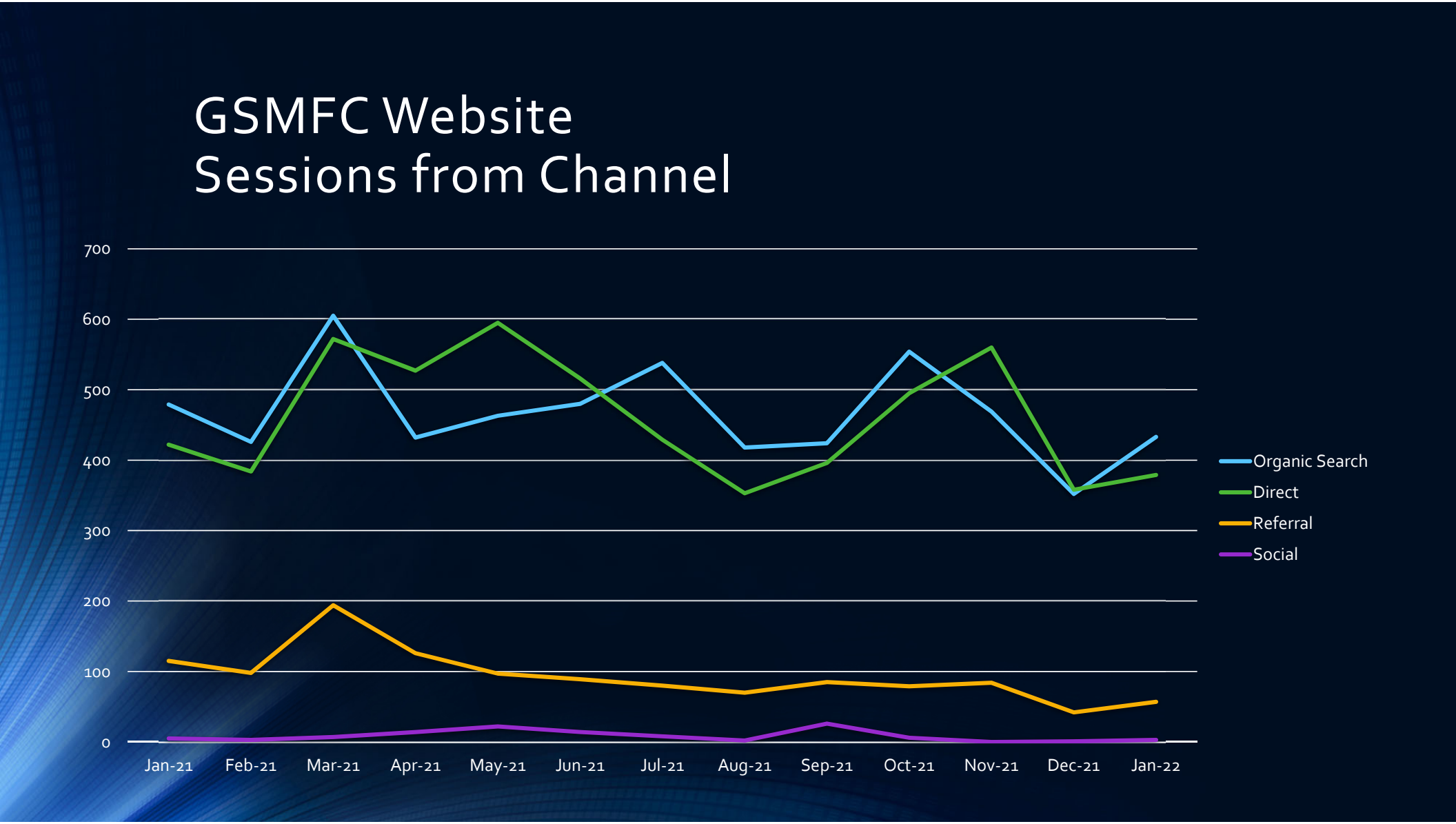

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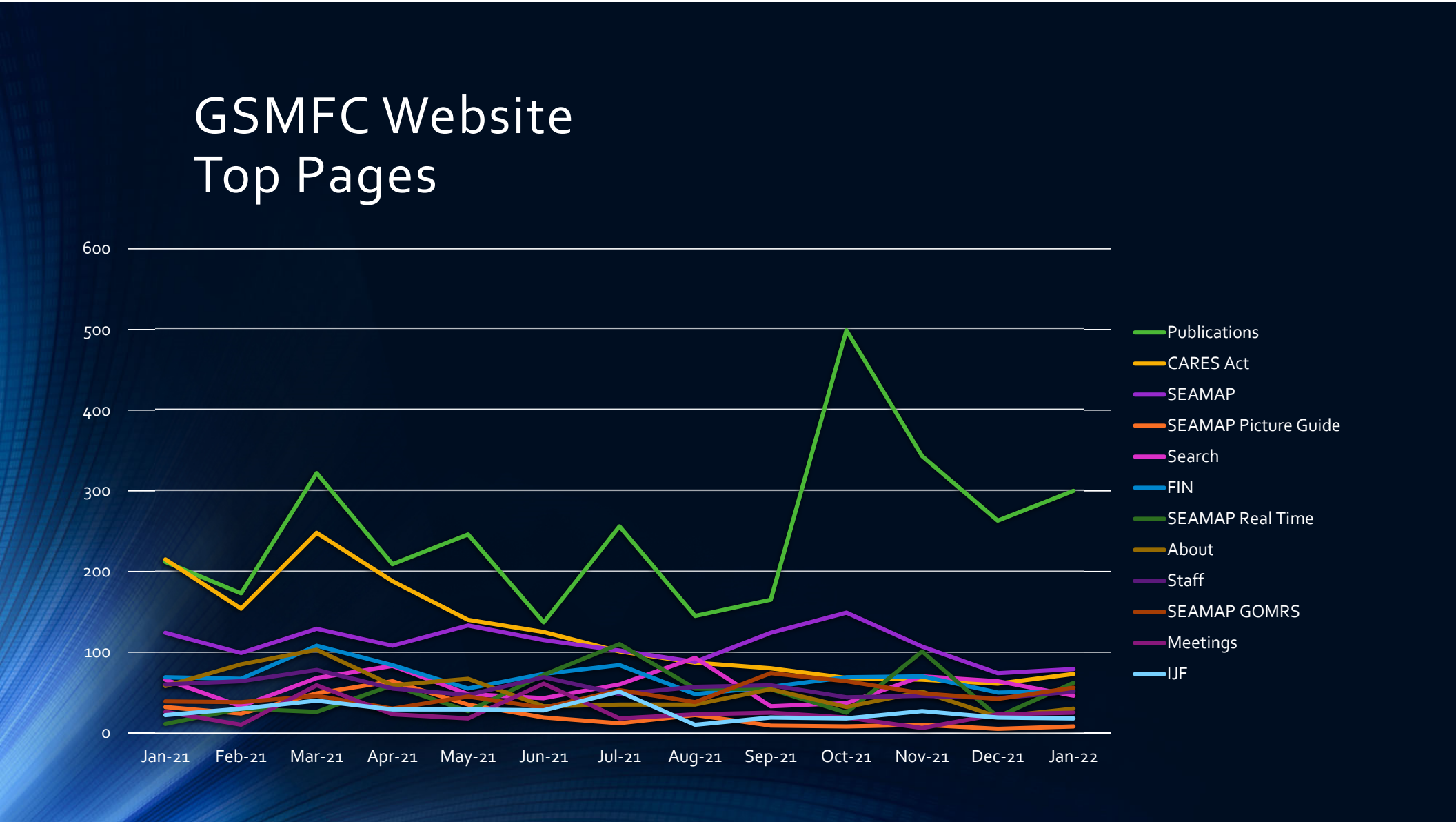

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