



Mississippi Recreational Red Snapper Exempted Fishing Permit Application

Date:

January 17, 2018

Applicant:

Mississippi Department of Marine Resources (MDMR)
1141 Bayview Ave. Biloxi, MS 39530
(228) 374-5000

Contact (Principal Investigator):

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Purpose:

- Determine if a recreational Mississippi landed ACL for Red Snapper (*Lutjanus campechanus*) can be accurately attained.
- Gather scientific data that is currently limited on Red Snapper in the Northern Gulf of Mexico.
 - Assess an alternative method to manage recreational Red Snapper by monitoring harvest in near-real-time.
 - Provide managers with accurate and near-real-time harvest estimates.
 - Provide managers with recreational harvest estimates by habitat type.
 - Provide recreational for-hire anglers and private recreational anglers a better opportunity to sustainably harvest fish, adding to the economy of local coastal communities. This is accomplished by extending fishing days in federal waters while decreasing harvest pressures in state waters out to nine miles.
 - Collect information on length, weight, age, and reproductive characteristics to assist managers in evaluating the relative condition of the Red Snapper population.

Background:

- Red Snapper are highly sought-after species by private recreational and for-hire anglers, despite the federal seasons having continued to be shortened.
- Accurate and timely estimation of recreational Red Snapper harvest and angler effort is crucial for the current reef fish management plan.
- MDMR is currently using the electronic reporting system, “Tails n’ Scales”, for data collection on recreational harvest during state and federal seasons. This reporting system allows managers to gain information (number of fish harvested and released, number of

anglers, hours fished for Red Snapper, and habitat fished) in near real-time; additionally, this program also collects biological information about the fish harvested (e.g. length, weight, sex, age) through the verification process when anglers are intercepted dockside.

- While the Marine Recreational Information Program (MRIP) provides information on fishing pressure, harvest, and biological data, this program is not a reliable source of real-time landings of Red Snapper.
- Currently managers in Mississippi are using a combination of these methods (observer trips, Tails n' Scales and MRIP) to collect and analyze data on reef fish harvest.
- Obtaining an EFP would allow managers to evaluate an alternative approach that could increase for-hire and private recreational angler's flexibility to access the Red Snapper resource by extending the season.

Methods:

- The EFP will permit for-hire and private recreational anglers to harvest Red Snapper from Mississippi state and federal waters out to 200 miles using the Tails n' Scales landing program (refer to Appendix A for the methods document). The continuous season would begin May 1, of 2018 and 2019 while remaining open until the established quota is reached within each year.
- Anglers can retain two Red Snapper per person per day with a minimum size limit of 16" TL. On state and federal for-hire vessels, captain and crew are excluded from possessing a bag limit of Red Snapper.
- A quota of 154,100 pounds will be set for the EFP for private recreational anglers and state charter for-hire sector to harvest Red Snapper annually for a total of two years. An annual quota of 30,444 pounds will be set for the federally permitted charter sector to harvest Red Snapper. The total annual quota requested in this EFP for Red Snapper will be set at 184,544 pounds which represents the 2017 harvest captured through the mandatory Tails n' Scales electronic reporting system for these respective components. The EFP will be effective the years of 2018 and 2019.
- Due to high compliance rates, a suitable number of dockside intercepts capturing biological data, and validating trip information MDMR has a high level of confidence that the 2017 Red Snapper harvest is most representative of Mississippi's annual sustainable harvest. MDMR has determined the requested quota in this EFP will provide anglers greater flexibility and opportunity outside of the regular federal Red Snapper season.
- The quota is to be enforced via mandatory reporting through the Tails n' Scales program. All vessels (private and for-hire) landing Red Snapper in Mississippi will be required to use the Tails n' Scales electronic reporting system regardless of harvest area (federal waters, Mississippi state waters, adjacent states' waters, etc.). There are no exemptions. One angler per vessel will be required to possess a trip number from the reporting system when targeting Red Snapper. When approached by law enforcement, trip numbers will be checked with the reporting system database for that day. If angler is found to be noncompliant with the Tails n' Scales reporting system, they will be subject to a ticket and subsequently legal fines and penalties.
- To validate reported for-hire catch, observer-based data collection aboard recreational for-hire vessels operating out of Mississippi coastal harbors will be employed. Data collected

will include: number of anglers, hours fished, number and size of fish retained by species, number and size of fish released by species, and disposition of fish at the time of release. Those data will provide more detailed and accurate assessments of the number and disposition of regulatory discards of select species.

- To validate reported private recreational catch, MDMR staff interviewers will utilize point survey intercept methods through MRIP and independent sampling methods based on pressure analysis and boat ramp pressure estimated from Tails n' Scales. Staff on site will attempt to collect: trip authorization number, vessel registration number, number of anglers, hours fished, number of fish released, fish retained, and any biological data (length, weight, sex, and otolith collection) of the retained fish.
- Additional validation methods will also be used; phone validations and visual effort validations.
 - Phone validations include calling Tails n' Scales users with expired trips to either complete information and close out or remove trips from the system.
 - Visual effort validations are completed by two vehicles (aircraft and MDMR vessel) to count vessels. Aircraft missions will utilize the Civil Air Patrol (CAP), with one captain and two MDMR staff on board. Aircraft range will be limited to an area no greater than 60 miles south of the barrier islands. For areas south of the aircraft range and out to 200 miles, a MDMR vessel will be utilized to complete vessel counts. Personnel will visually inspect off-shore fishing sites within the designated area.
 - On-the-water enforcement conducted by Marine Patrol officers, who can intercept anglers as they are leaving or returning from trips targeting Red Snapper.
- A buffer of 10% of the ACT will be set to ensure allotted poundage for Red Snapper is not exceeded. The harvest data captured through the Tails n' Scales program will be available daily. Monitoring the daily harvest report will allow MDMR the ability to close the season within three days of the buffered annual allotment being attained. While Tails n' Scales has the ability to close within one day, due to public notice legal requirements a three-day notification is mandatory for fishery closures. Public notices will be issued and posted prior to the closure of the respected seasons. Closure notices will also be emailed to all registered users of the Tails n' Scales program. If the allotted poundage allocated for Red Snapper is exceeded in 2018, the overage will be deducted from Mississippi's 2019 catch limit (ACL). This is not anticipated due to the accuracy of the Tails n' Scales reporting program.
- Anglers eligible to participate in the EFP will be those that have registered in Tails n' Scales prior to *established date (May 1 of each year)*. Anglers are required to be registered in the system as a user to obtain authorization prior to each trip. Anglers can receive trip authorization numbers five days prior to starting their trip. Anglers also have the availability to abandon a trip should they encounter an issue such as inclement weather or mechanical complications. Trip authorization numbers are valid for 24-hours from the time of trip departure and must to be closed out each time before a new trip number is issued. (refer to Appendix A page 10).

Data Objectives:

- Information collected in Tails n' Scales for Red Snapper:
 - Prior to fishing:
 - Name of registered user

- Trip date
- Trip start time
- Landing county
- Landing site (within chosen county)
- Vessel registration number or Coast Guard Documentation number
- At trip completion:
 - Number of anglers
 - Number of Red Snapper harvested
 - Number of Red Snapper released
 - Hours spent fishing for Red Snapper
- Habitat fished (artificial reef, natural bottom, rig)
- Have accuracy metrics when managing toward a state quota.
- Determine harvest rates for recreational sectors in Mississippi when targeting Red Snapper.
- Age/growth rates: Many models frequently used in stock assessments require the development of an Age at Length Key (ALK). This is estimated from samples collected from a population and used to predict the mean length-at-age over the lifetime of the species. Reliable estimates are vital to the accuracy of the stock assessment. Red Snapper collected under this permit will be measured (mm) for Total Length (TL), Fork Length (FL), and Standard Length (SL), as well as weighed (g). Otoliths from Red Snapper will be removed and processed for aging. These observed lengths and ages will be the inputs used in developing the ALK.
- The results of this EFP will be used to assist managers in future decisions regarding the Red Snapper seasons. This approach allows MDMR to collect additional data on this species.
- Restructuring the Red Snapper season will provide private recreational anglers and the for-hire sector flexibility and better opportunities to fish over the two-year EFP period.

Permit Process Facts:

- Present request of EFP is under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.), and regulations 50 DFR 600.745 (b) concerning exempted fishing.
- The NMFS Regional Administrator has the authority to approve the EFP sought by this application. This “out of season” harvest by anglers would otherwise be prohibited by NMFS regulations for the designated purposes of data collection proposed by MDMR.

Potential Questions:

- Are there any anticipated environmental impacts on fisheries, marine mammals, endangered species, or Essential Fish Habitat?
 - No, see bulleted explanation list below
 - The EFP does not propose to increase the catch effort or harvest for this fishery. It does not allow for the opening of any new or currently restricted areas. The EFP will continue to adhere to the federal size and bag limits established by National Marine Fisheries Service. The goal of this EFP is to provide anglers with greater flexibility and more opportunities for harvest of

- Red Snapper while remaining within the gulf-wide quota; therefore, not impacting the rebuilding plan for this species.
- Plan set forth to adjust total catch from regular state and federal seasons to avoid going over the annual quota of Red Snapper.
 - Bycatch will be monitored and recorded through the observer trip program, MRIP, and independent boat ramp intercepts.
 - There are no foreseeable impacts on marine mammals through this EFP.
- What if an angler wants to register for Tails n' Scales after the specified date? Can they still participate in the EFP, regular and state seasons?
 - Yes, anglers can participate after the EFP season has been set but before the season takes place.
 - A process will be developed for anglers wanting to register after the EFP season has been set.

Signature of the Applicant:





Joe Jewell

Date

Marine Fisheries Director

Mississippi Department of Marine Resources

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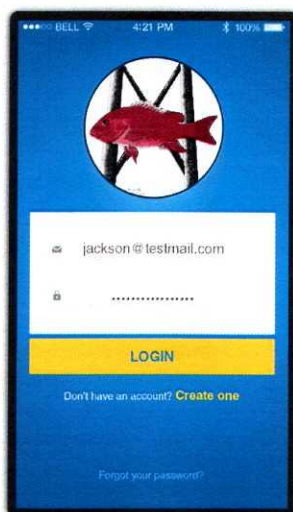
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MANDATORY RED SNAPPER REPORTING PROGRAM
2016 METHODS AND RESULTS



July 2017

BACKGROUND

Red Snapper is currently one of the most recreationally targeted reef fishes; however, recent declines in the population have led to numerous regulation changes in the Gulf of Mexico. Currently, state and federal seasons for Red Snapper are two of the most anticipated seasons for anglers in Mississippi. With this in mind, the Mississippi Department of Marine Resources (MDMR) has created and enhanced artificial reefs south of the barrier islands in Mississippi territorial waters and adjacent federal waters over the last several years. These artificial reefs have provided important habitats for Red Snapper and ease of access and opportunity for harvest for Mississippi recreational anglers. This increase in participation has led to numerous difficulties gathering catch and effort data from anglers, which will be addressed further in this document.

Table 1: Red Snapper federal season lengths from 2010 to 2017

	2010	2011	2012	2013	2014	2015	2016	2017
Federal Season	77 days	48 days	46 days	42 days	9 days	10 days	11 days	3 days*

*Initial federal season began on June 1st and ended June 3rd. However, the recent federal season extension increased the number of days from three to forty-two (including those first three days). The federal extended season began again on June 16th allowing private recreational anglers to fish on Fridays, Saturdays, and Sundays only.

The NOAA implemented federal private recreational season changed from 53 days in 2010 to 3 days in 2017. The National Oceanic and Atmospheric Administration's (NOAA) data show that Red Snapper quotas have been exceeded in recent years and as a result, seasons have become shorter giving anglers less access to this fishery (Gulf of Mexico Fishery Management Council 2014, 2015; NOAA Southeast Regional Office, 2013). Historically, MDMR has set the state Red Snapper season to coincide with the federal season, but as the length of the federal fishing seasons has continued to decrease, MDMR implemented a longer state Red Snapper season in 2014. The implementation of the longer season is consistent with other gulf states that also have developed their own Red Snapper state seasons.

Table 2: Red Snapper federal and state fishing season lengths

	2010	2011	2012	2013	2014	2015	2016	2017
Federal Season	77 days	48 days	46 days	42 days	9 days	10 days	11 days	3 days
MS State Season	77 days	48 days	46 days	42 days	27 days	108 days	102 days	102 days
LA State Season	77 days	48 days	46 days	85 days	174 days	142 days	272 days	N/A
AL State Season	77 days	48 days	46 days	42 days	18 days	51 days	66 days	67 days
FL State Season	77 days	48 days	46 days	65 days	52 days	70 days	78 days	78 days
Texas State Season	365 days	365 days	365 days	365 days	365 days	365 days	365 days	365 days

In preparation for the state season, the Commission on Marine Resources (CMR) adopted a regulatory modification to Title 22 Part 9 Rules and Regulations for Statistical Reporting and Confidentiality of Statistical Data for Marine Fisheries in the State of Mississippi, in 2014, in regards to reporting Red Snapper landings in the state of Mississippi. This regulatory modification made it mandatory, beginning in 2015, to report all recreational Red Snapper landings in the state. MDMR recognized the need for more accurate and timely reporting on Red Snapper and developed the Tails n' Scales electronic reporting system so that anglers can conveniently and easily report harvest data from each trip. The Tails n' Scales reporting system was made available online and through a mobile phone application as well as a toll-free number connected to a call center. Accurate estimation of recreational Red Snapper harvest and angler effort is crucial for MDMR and the current Gulf-wide management approach. Accurate estimation of seasonal harvest, including harvest within season, is valuable for fisheries managers to set and adjust fishing regulations. With the implementation of the Tails n' Scales reporting, MDMR is now able to collect Red Snapper data in real-time from Mississippi anglers. With the current interest in an intense regional approach to management, estimation of in-season harvest on a timely basis is of utmost importance in preventing overages and allowing each state and the Gulf entity to stay within its assigned quota.

Mississippi has a unique Red Snapper fishery that presents challenges to collecting accurate and real-time data due to numerous public boat launches and private docks. Anglers using private docks account for almost one third of Red Snapper landed in Mississippi; however, these anglers are not intercepted during routine Marine Recreational Information program (MRIP) surveys. Also, there are numerous public boat launches (coast wide) available to anglers and routine Marine Recreational Information Program (MRIP) surveys are not able to capture an adequate amount of Red Snapper data due to the short season. For instance, in 2015, no MRIP surveys encountered Red Snapper harvested by recreational anglers resulting in an estimate of zero pounds harvested for all recreational anglers in Mississippi. In this same year, Tails n' Scales data indicated that over 70,000 lbs of Red Snapper were harvested in the recreational sector. The MRIP surveys and intercepts work well with capturing data from the inshore fishery and captures some Red Snapper data, but the Tail n' Scales mandatory Red Snapper reporting system allows MDMR to collect data from the majority of recreational Red Snapper anglers in Mississippi. In addition to mandatory reporting, Marine Patrol (law enforcement) has the ability to check anglers on the water in the passes between the barrier islands. The passes create "bottlenecks" for returning vessels and allows for on-the-water intercepts to further enforce mandatory Red Snapper reporting. Marine Patrol also involves a progressive penalty for each transgression, meaning an angler who receives three citations for failing to report Red Snapper trips will result in a substantial fine and the possible suspension of the angler's saltwater fishing license for one year. These efforts, combined with the Tails n' Scales reporting system have allowed MDMR to vastly improve its database by defining a universe of anglers and allowing for an accurate number of Red Snapper landed in Mississippi to be documented. The following sections of this document outline a summary of results from the 2015 and 2016 seasons and methods used to obtain the results.

METHODS

A. Reporting

All recreational vessels (private and for-hire) landing Red Snapper in Mississippi are required to use the Tails n' Scales electronic reporting system regardless of harvest area (Federal waters, Mississippi state waters, adjacent states' waters, etc.). There are no exemptions. One angler per

vessel per trip is required to possess an authorization number from the reporting system when targeting Red Snapper. One unique aspect of Mississippi's reporting system is the requirement that anglers must apply for an authorization number prior to fishing for Red Snapper. Anglers can apply for the number up to five days before starting their trip; however, they can also apply for the number minutes before beginning their trip. Requiring an authorization number prior to fishing has many useful purposes including validation of the daily number of vessels fishing, as a float plan for safety purposes and assistance to law enforcement.

MDMR promoted the system, at the beginning of 2015, the first year of the mandatory Tails n' Scales reporting program, posting signs and banners next to boat ramps, in marinas, and passed out business cards detailing where and how to download the mobile application, reporting requirements, and the toll-free number. Tails n' Scales was also publicized through press releases, on the MDMR website, and on social media and Mississippi anglers were informed of the reporting requirements at local fishing meetings (Gulf Fishing Banks, Coastal Conservation Association, and Ocean Springs Fly Fishing Club). Signs and banners are replaced at the boat ramps and marinas prior to the start of each year's Red Snapper season. MDMR continues to publicize Tails n' Scales on social media and remind anglers of the reporting requirements through email notifications and various news outlets. In 2016, more attention was placed on anglers living outside the three coastal counties to disseminate information on the reporting requirements due to feedback received in 2015 from those anglers unaware of the need to report their Red Snapper harvest.

Reporting Options:

MDMR wanted to make the electronic reporting system as user-friendly and easily accessible as possible so that it would take only a few minutes for anglers to record their trip information. Generally, the more questions a survey has and the longer a survey takes, the less likely anglers are to report. With those two thoughts in mind, MDMR gave anglers three methods to report their trip information assuring even anglers without smartphones or access to email would have a way to report. To properly obtain a trip authorization number, one representative from each vessel must create a trip in the reporting system prior to fishing. Trip authorization numbers are valid for 24 hours from the time of trip departure and must to be closed out each time before a new trip number is issued. Trips can only be created up to five days in advance. Registration,

obtaining trip authorization numbers, and reporting harvest can be done using one of three methods: through the Tails n' Scales mobile applications, (available on both iPhone and Android devices), online at www.tailsnscales.org, and by phone through the toll-free number (1-844-MSSNAPP).

The toll-free number directly connects users to a call center available 24 hours a day, seven days a week. The decision was made in 2015 to use live agents rather than an interactive voice response system so that anglers would be more likely to give their trip information. Call agents have access to a special profile within the system that grants them access only to reset passwords. Otherwise, they use the angler's own profile to create and close trips. The toll-free number can be used to register, create new trips and close out trips. In the event that a user does not have an email account or does not have access to the Tails n' Scales electronic reporting system online or on a mobile device, the toll-free number is always accessible; however, MDMR encourages anglers to use the free downloadable app or visit the website to proceed through the reporting process. If any users of the Tails n' Scales program have questions or concerns regarding reporting, MDMR has created and maintained an email specifically for anglers to comment on or ask questions regarding Red Snapper reporting.

To register in the Tails n' Scales system, users are required to provide their first and last name, a valid email, phone number, home address, and either the vessel's state registration number or the U.S. Coast Guard vessel documentation number. Vessel type (private or for-hire) must be indicated and a vessel name provided if applicable. Users are not allowed to complete registration until all required fields are completed. Once registered, users are allowed to use more than one method to create and complete trips. In 2016, email verification was added to the reporting system in order to validate emails used to log in. Due to the modification, users must now register in the system then verify their account through an email that confirms the status of their email account as valid.

If a trip is created that has been rescheduled or cancelled, the user must abandon that trip and provide a reason code. Anglers cannot create a new trip number until the current trip is abandoned and a reason provided. This allows administrators to maintain a closed trip universe whereby anglers are forced to report their trip before starting a new one.

All questions pertaining to closing a trip in the system are required to be answered: the amount

of time spent fishing for Red Snapper to the nearest half hour, the number of people fishing on the vessel, the number of Red Snapper harvested, and the habitat where the majority of time is spent fishing. The addition of the number of Red Snapper discards was added as a requirement to the close trip process in 2016.

The reporting system is housed on a secured server which stores all data. These data are then exported into analyzing software for analyses. The flow of data, data access, and user interaction is restricted at each level of the process depending on user group (angler, call center staff, administrator, and Marine Patrol) (Figure 1).

There are multiple parts to the Tails n' Scales system based on the user type and purpose. MDMR project managers have administrative access and the ability to see all information about all past, present, and pending trips and update or change any personal or trip information. Marine Patrol may access only those trips that are marked as active for that day; when approached by Marine Patrol, trip numbers are checked against the reporting system database for that day. The call center connected to the 1-844-MSSNAPP number, has access to users' names and emails so that the call agent may verify the user calling before helping the user with their question. Call agents have the ability to reset passwords should the user not remember the information to log in to their account. Anglers only have access to their own personal trip information, which includes archived trip data from previous years.

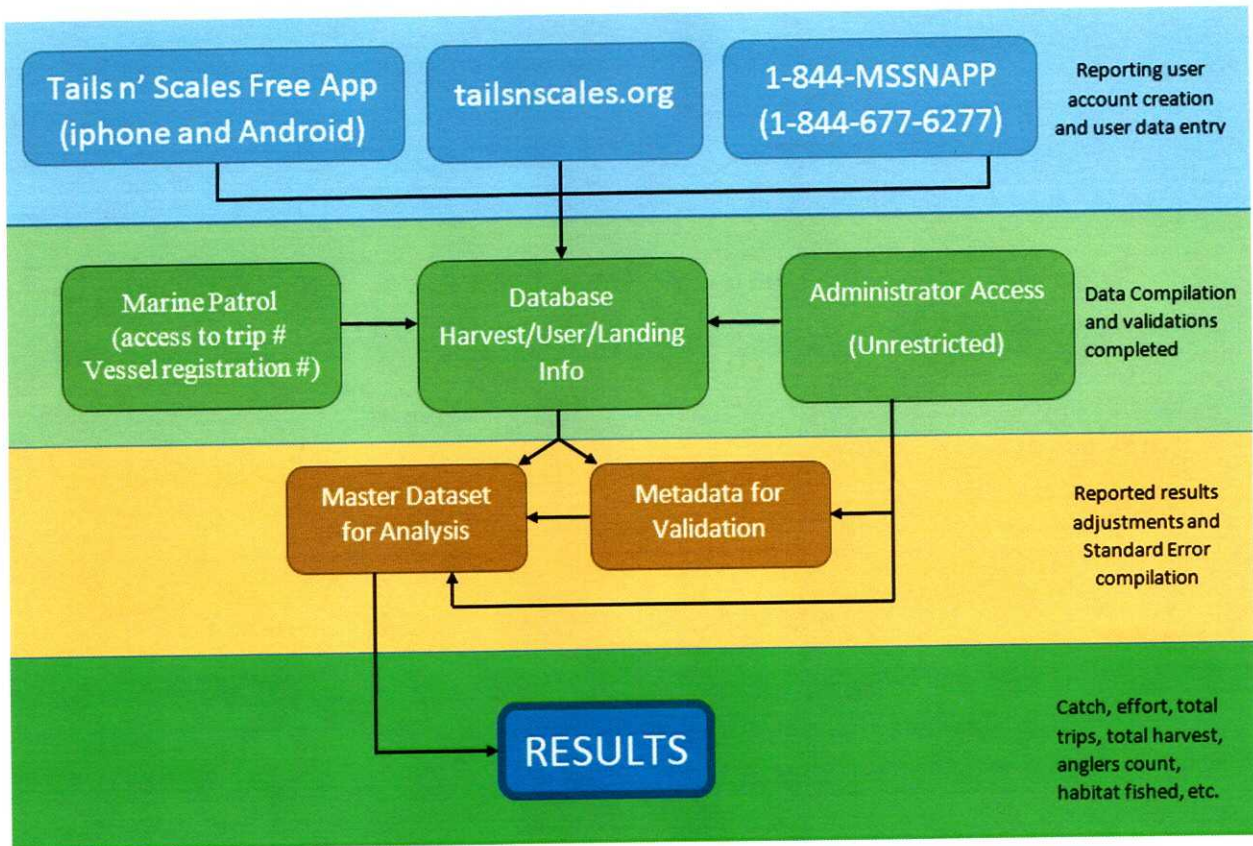


Figure 1: Flow chart illustrating user interaction and data flow through the reporting system.

B. Validations

Validations have been conducted using two different methods; however, only the first method is currently used to validate trips before applying the estimator. The second method is simply supplemental now and used to maintain expired trips at less than five percent of total trips each year. Access point intercept survey validations were completed to gather bio-sampling data (fish lengths, weights and otoliths), and phone validations were used to determine non-reporting, under- and over-reporting as well. The access point intercept survey information provided the inputs for validation and adjustment analyses (correction factors) for all user groups (private and for-hire) and seasons (federal and state) involving Red Snapper. Similar to MRIP surveys, validations and adjustment analyses for all user groups and seasons were split into six waves, each wave being a period of two months.

1. *Access Point Intercept Survey Validations*

To conduct access point intercept survey validations, a site pressure analysis was performed to select assignment times and locations accounting for pressures (high or low

vessel traffic) at public boat ramps along the Mississippi coast. For 2016, all sites with the potential to have boats launch that may fish for Red Snapper were included in the site list. Trip data from 2015 and 2016 were combined to determine each site's pressure value. Four, six-hour time blocks were created for survey time assignments (2 a.m.-8 a.m., 8 a.m.-2 p.m., 2 p.m.-8 p.m., and 8 p.m.-2 a.m.). Weekday and weekend assignment locations and times were randomly assigned from a pressure frequency distribution acquired from the created trips in the Tails n' Scales database (Figure 2A and B). Overall, assignment selection was performed for both site locations and time blocks by calculating the cumulative combined pressures and multiplying by 100.

The number of trips per site were totaled for each site to get a combined value of total trips. These values were calculated separately for weekday and weekends and were the beginning values for each site's pressure. For sites with no fishing pressure, meaning no trips were recorded as leaving from that site, they were given an initial pressure value of 0.5. A percent abundance was calculated by dividing each site pressure value by the total number of site pressure values and multiplying by 100. Then each site's pressure became the product produced for the site pressure value and added to the previous site's combined pressure (Table 3A and B). Numbers created using a random number generator in R[®] statistical software (setRNG package) were then used for assignment selection. During the first year of the program (2015), the reported pressure values were created using the distributions of launch locations and ramp arrival times reported from the first weekday and first weekend day of the season. The combination of values from years 2015 and 2016 provided a larger data pool of weekday and weekend distributions to assign pressure values for both location and time. If a time block or site was randomly selected twice, it was assumed a high-pressure instance and two surveyors were assigned to that particular assignment time.

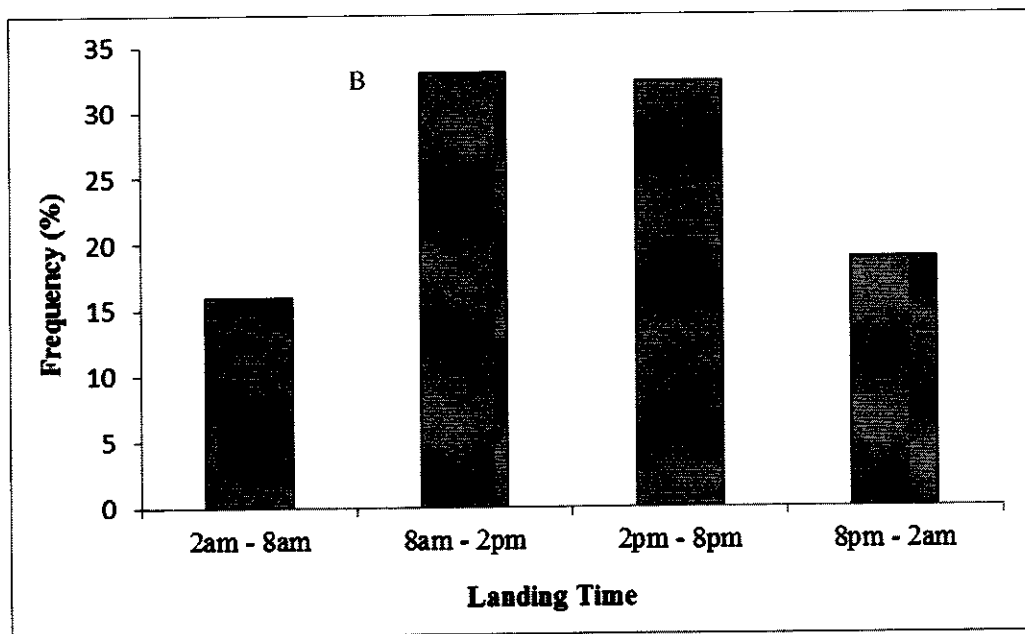
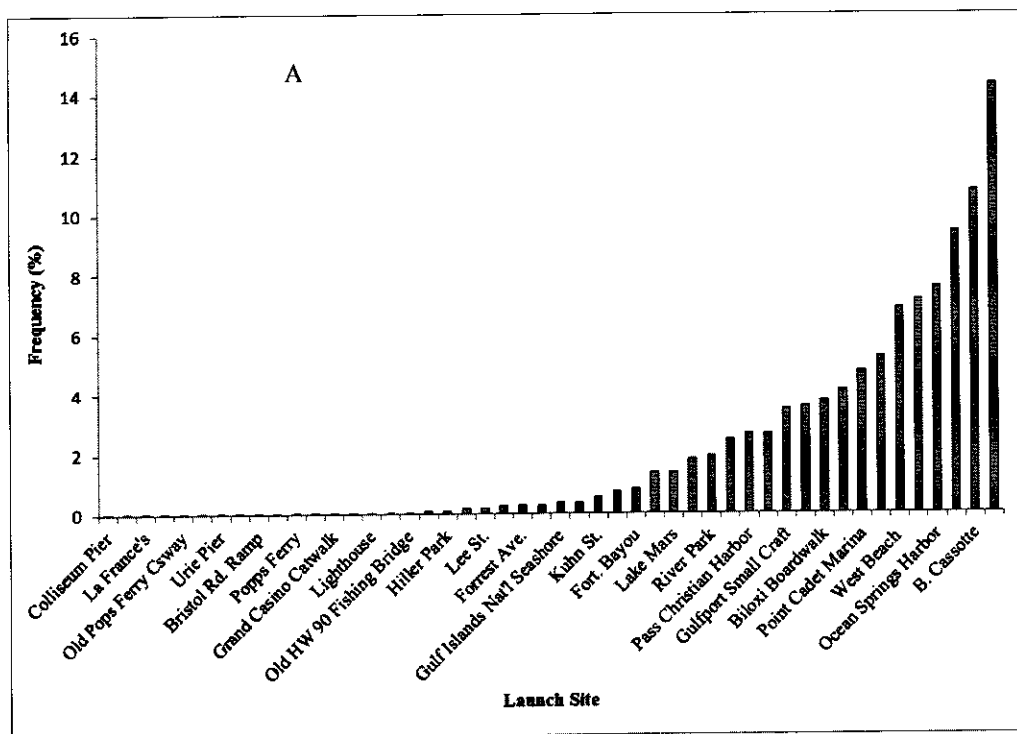


Figure 2: (A) Site pressure values using 2015 and 2016 weekday reported data. (B) Time pressure values using 2015 and 2016 weekday reported data. Site and time pressure values for weekend days were calculated using the same method. Subsequent years will use all past reported pressure values split by ramp and day type.

Table 3A: Site pressure summary value ranges for the combined federal and state Red Snapper seasons using 2015 and 2016 weekday reported data. Weekend site pressure values were calculated the same way using only trip data reported from weekend days.

Site	Pressure Value	Cumulative Combined Pressure	Pressure Range
Coliseum Pier	0.5	5	1-5
Kremer Marine	0.5	10	6-10
La France's	0.5	14	11-14
Little Joe's	0.5	19	15-19
Old Pops Ferry Causeway	0.5	23	20-23
Pearlington Ramp	0.5	28	23-28
Urie Pier	0.5	32	29-32
Cedar Point	0.5	37	33-37
Bristol Rd. Ramp	0.5	42	39-42
GCRL	0.5	46	43-46
Popps Ferry	0.5	51	47-51
Washington Street Ramp	0.5	55	52-55
Grand Casino Catwalk	0.5	60	56-60
8-Mile	0.5	64	57-64
Lighthouse	0.5	69	65-69
Broadwater Beach Marina	0.5	73	70-73
Old Hwy 90 Fishing Bridge	0.5	78	74-78
Parkers Creek Ramp	1	87	79-87
Hiller Park	1	96	88-96
Choctaw Marina	2	114	97-114
Lee St.	2	133	115-133
Bayou. Caddy	3	160	134-160
Forrest Ave.	3	187	161-187
Gulfport Lake	3	215	188-215
Gulf Islands Nat'l Seashore	4	251	216-251
Bay St. Louis Harbor	4	288	252-288
Kuhn St.	6	342	289-342
Courthouse Rd Ramp	8	415	343-415
Fort. Bayou	9	498	416-498
Gautier City Park	15	634	499-634
Lake Mars	15	771	635-771
Keesler Marina	20	954	772-954
River Park	21	1145	955-1145
Brittany Ave.	27	1391	1146-1391
Pass Christian Harbor	29	1656	1392-1656
Long Beach Harbor	29	1920	1657-1920
Gulfport Small Craft	38	2267	1921-2267

D'Iberville Ramp	39	2622	2268-2622
Biloxi Boardwalk	41	2996	2623-2996
Graveline	45	3407	2997-3407
Point Cadet Marina	52	3881	3408-3881
Hwy 90 Pascagoula	57	4401	3882-4401
West Beach	75	5085	4402-5085
Mary Walker Marina	78	5796	5086-5796
Ocean Springs Harbor	83	6553	5797-6553
Pascagoula Lighthouse	103	7493	6554-7493
Bayou Cassotte	118	8569	7494-8569
Biloxi Small Craft	157	10000	8570-10000

Table 3B: Time pressure summary value ranges for the combined federal and state Red Snapper seasons using 2015 and 2016 reported data. Weekend time pressure values were calculated the same way using only trip data reported from weekend days.

Day	Time Block	Cumulative Combined Pressure	Pressure Range
Weekday	0200-0800	798	1-798
Weekday	2000-0200	1740	799-1740
Weekday	1400-2000	3352	1741-3352
Weekday	0800-1400	5000	3353-5000

MDMR staff approaches all boats landing at the designated site. After initial contact and introduction, the surveyor inquires if they have targeted Red Snapper during their trip. Anglers in vessels that have targeted Red Snapper are asked a series of questions for validation purposes; if the vessel has a valid authorization number and if so, the number is recorded by the surveyor, vessel registration number, habitat type fished (artificial reef, natural bottom, oil/gas platform), number of Red Snapper kept, number of Red Snapper released, number of anglers, hours fished, and trip type (private/for-hire).

During the 2016 state season, survey validation was the same as the federal season excluding the location and time assignments. Because of the staffing constraint of multiple projects, the Recreational Information Program's (MRIP) Access Point Angler Intercept Survey (APAIS) was used to assign times and locations (APAIS Methods and Techniques Manual 2014).

2. *Phone Validations*

Telephone validation interviews were performed by MDMR staff. Within the first two seasons (2015 and 2016), all expired trips were contacted by staff and verified by an MDMR employee closing out the expired trip for the angler. This violates the independence assumption of the capture/recapture method but was done only to show the functionality of the estimator equations; however, from this point forward these trips will be excluded from the estimator. Each year, no more than 5% of the expired trips remain after the season ends. Expired trips do not reset at the end of each season. Anglers with expired trips at the end of one season will not be allowed to fish the following season until their trip has been closed. All questions answered in the reporting system (listed in Section A) are verified by the staff caller.

C. Biosampling

To acquire biological data, MDMR staff conducting the validation interviews requests permission from the angler to measure all Red Snapper landed. Data collected includes weights (g) and lengths (FL, TL in mm) as well as collection of sagittal otoliths. These data are used for calculating the mean weights, lengths and ages for landings estimations and for future stock assessment inputs. Additional methods can be found in MDMR's biological processors methodology report (NOAA-NMFS-SE Interjurisdictional Fisheries Report 2013-2003494).

D. Anglers, Trip, and Fish Harvest Estimator

To estimate the number of anglers, trips, and fish harvested in Mississippi, data are split into waves similar to the MRIP framework. For each wave, the data are then split into the recreational and for-hire sectors, as we assume the compliance rate may differ between the two sectors. Validations in the form of intercepts are then input along with ramp pressure into a capture-recapture estimator. The capture/recapture method was chosen as it was assumed that inputs were independent. The estimator used is (i = intercept),

$$\hat{N}_{yc} = N_y * \frac{\sum_i \varepsilon_{s2} w_i y_i}{\sum_i \varepsilon_{s2} w_i r_i y_i^*}$$

Where $\hat{N}_{yc}$ is the number caught and is estimated by calculating the number reported (N_y) and multiplying that by a correction factor which includes the sum of correct and incorrect intercepts as well as individual weights based on ramp pressure ($\frac{\sum_i \varepsilon_{s2} w_i y_i}{\sum_i \varepsilon_{s2} w_i r_i y_i^*}$). Because multiple ramps contain zero intercepts, a mean correction factor calculated from wave specific data is used to estimate the total number harvested. This correction assumes that no one ramp will have a 100% compliance rate, so an estimated correction has to be used. Individual standard error, by wave, is calculated and summed to yield total standard error, as propagating uncertainty of a sum is additive. To calculate total biomass harvested, wave-specific mean total weights for each sector are calculated based on MRIP and Tails n' Scales intercept surveys to ensure the most accurate biomass estimates possible.

RESULTS

For the purposes of this document, 2016 was the first full year with all validation methods implemented that were discussed in the Tails n' Scales program review (Breidt et al. 2016). Therefore, results presented here include 2016 data only. At the end of the 2016 recreational Red Snapper season, only waves two and three had validations available in intercept form, so the empirical data gathered in these waves were used to estimate totals for all other waves (Table 4A). The for-hire sector only had trip data available during the federal for-hire season, with the exception of one state for-hire trip during wave three (Table 4B).

Table 4. Total reported and estimated fish harvested, trips, and anglers for both the A.) Recreational and B.) For-hire sectors by wave.

A.

Wave #	Reported Fish	Estimated Fish	Reported Trips	Estimated Trips	Reported Anglers	Estimated Anglers
1	127	160	28	32	91	124
2	113	142	23	26	75	102
3	6065	8056	1121	1152	4295	4823
4	2991	3589	673	673	2387	3254
5	207	261	72	82	211	287
6	30	38	7	8	20	27

B.

Wave #	Reported Fish	Estimated Fish	Reported Trips	Estimated Trips	Reported Anglers	Estimated Anglers
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	1254	1263	112	118	728	732
4	864	930	83	89	548	602
5	16	16	2	2	8	8
6	0	0	0	0	0	0

As expected, the largest numbers of trips were observed during waves three and four, as these waves encompassed both the federal and state red snapper seasons. Minimal harvest was observed in waves one, two, and six from anglers fishing in Louisiana waters and landing their catch in Mississippi. Estimated biomass harvested was derived from the total estimated fish caught multiplied by the wave-specific average weights gathered from intercept data. The total harvest was calculated at 95,272.374 pounds of Red Snapper (Table 6). A PSE of 11.23% was estimated for the biomass harvested.

Table 6. Estimated harvested biomass of Red Snapper landed in Mississippi in 2016

Wave	Recreational	For-Hire
1	1,084.936	0
2	965.336	0
3	54,628.178	6,665.167
4	24,335.232	6,250.022
5	1,498.400	43.820
6	256.284	0
Total	82,768.365	12,959.009
MS 2016 Total Harvest (lbs)		95,727.374 (PSE = 11.23)

2017 SYSTEM UPDATES AND FUTURE DATA NEEDS

As described in the sections above, the data gathered in previous years were reanalyzed based upon the recommendations of NOAA staff and survey consultants who have thoroughly reviewed the program and provided helpful and informative feedback (Breidt et al. 2016). MDMR has directed staff during the 2017 Red Snapper season to gather the proper data needed to continue to increase the efficiency and validity of the Tails n' Scales program.

Prior to the 2017 season opening, Tails n' Scales developers modified the mobile application and web portal screens to reduce the number of sites in the landing sites list by first having the angler choose the county in which they will land their fish. Once the county is chosen, the reporting system lists only the landing sites within that county. Although this adds an additional question to the survey when anglers are creating their trip, the implementation of choosing the county before choosing the landing site may increase the number of accurate responses. Anglers may be less likely to choose the first few sites on the screen rather than scroll through the list of sites.

Because the estimator is based on a capture-recapture method and validations used in the estimator are data captured from intercepts, MDMR has directed staff to increase the number of dockside intercepts during the 2017 season as much as time, weather and staff availability permits. Due to the initially short federal season, Tails n' Scales intercepts were scheduled to extend throughout the state season and will now be modified to intercept recreational Red Snapper anglers on weekends until the end of the extended federal season on September 4th.

However, dockside intercept surveys are a validation method that requires ample time and staffing; therefore, due to potential staff constraints and overlap with other agency programs, supplemental data is still being gathered through on-the-water and airplane observations as they are still considered worthwhile to continue collecting.

One uncertainty that still exists within the recreational Red Snapper universe is the determination of differences between public and private access angling trips. The Tails n' Scales system provides an opportunity to collect the data necessary to lower this uncertainty. To help determine whether the reporting compliance rates and catch rates differ between public and private access sites, MDMR staff has been working closely with Marine Patrol to conduct on-the-water intercepts. Ideally, Marine Patrol will be able to gather enough intercept data to produce a reasonable estimate of compliance. Combined with data from public access point Tails n' Scales intercepts, an estimate can be made for the compliance rate of private access anglers. In addition, MDMR staff is currently acquiring information to schedule samples by appointment, allowing staff the means to validate trip information and collect biological data from private anglers' harvested Red Snapper. To test the feasibility of this portion of the reporting program, the anglers interviewed will be preselected; however, MDMR staff hopes to extend this sampling process to a randomly selected sample of private access anglers.

Considering the data collected through the Tails n' Scales reporting program and its future progression, MDMR is confident the data being collected accurately estimates recreational Red Snapper landings in Mississippi. MDMR is confident in the ability of Tails n' Scales to collect pertinent information on Mississippi recreational Red Snapper anglers and their harvest to provide accurate and timely data for future stock assessments and ensure the continuation of best fishery management practices.

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