

Application for Exempted Fishing Permit

February 25, 2015

Applicant Name: Mississippi Department of Marine Resources, 1141 Bayview Ave,

Biloxi MS, 39530. 228-374-5000

Target Species: Red Drum, *Sciaenops ocellatus*

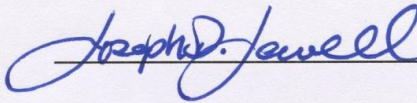
Amount of harvest necessary: 2000 individual fish

Statement of Purposes and goals of the exempted fishery for which an EFP is needed including justification for issuance of the EFP: See attached project narrative.

Anticipated impacts on the environment:

- a) Fisheries: minimal and insignificant impact
- b) Marine Mammals: none
- c) Threatened or endangered species: none
- d) EFH: none

Signature of the applicant



Date: 2.25.15

Benefits

- EEZ red drum collections
- Potentially providing the data inputs needed for central GOM stock assessments
- 1 per person
- Trip numbers required before harvest (pre-existing system in place)
- MDMR Biologists will meet vessels
- Collect size metrics, otoliths, stomach contents, histology and tissue (Molecular analyses)
- Trip numbers already established/small enough population to efficiently collect all data

Application for Exempted Fishing Permit

February 25, 2015

**Red Drum Exempted Fishing Permit
For the Economic Exclusion Zone in the Gulf of Mexico
2015-2016**



**Mississippi Department of Marine Resources
1141 Bayview Avenue Biloxi, MS 39530
Point of Contact: Joe Jewell
Joe.jewell@dmr.ms.gov**

Introduction

Red Drum (*Sciaenops ocellatus*) is a highly sought after species by sport fishermen in Mississippi coastal waters. They are primarily targeted as sub-adults in the estuaries because there is no legal fishery in offshore federal waters where adult fish live. The current Fishery Management Plan (FMP) last amended in 1988 by the Gulf States Marine Fisheries Commission (GSMFC), prohibited all harvest of Red Drum from the Exclusive Economic Zone (EEZ), and it remains so today. Since the federal moratorium, there has been a lack of recent assessment addressing vital life-history traits of Red Drum in Mississippi coastal waters and adjacent federal waters, including growth rates, length-at-age composition, histology, and diet (Powers 2012). Historically, fishery dependent census data collected from commercial fishermen using purse seines and gill nets in the EEZ contributed a major source of information (Comyns et al. 1991). Purse seines have been used in the past for tag and recapture surveys as well (Linton 2008), but in light of current restrictions to state waters, the logistics of completing such surveys have become much more complicated. These current restrictions limit the area from which spawning aggregations can be sampled. Furthermore, the turbidity of the water within the state's boundaries impedes the location of large spawning aggregations by spotter plane (Lohoefer et al. 1987). We believe the sampling methods described herein will be less likely to incur potential impacts on the spawning stock than the traditional methods.

Current monitoring for Red Drum in Mississippi state waters utilizes gill nets with separate panels of mesh sizes 2.0", 2.5", 2.75", 3.0", 3.5", 4.0", 5", 5.5", 6.0, 6.5", and 7.0". The station locations are almost exclusively estuarine, and the gill nets are selective for Red Drum ranging from approximately 10 to 30 inches total length (TL) (Porch et al. 2002). Larger individuals of the existing data set are obtained from the for-hire-industry. Captains of these boats participate in the monitoring by donating carcasses for processing by MDMR. These current sampling methods have not yielded sufficient amounts data for fish sizes greater than 20 inches TL. The for-hire industry is currently not permitted to take Red Drum from the EEZ where the preponderance of adult Red Drum reside.

Justification and Methods

In order to perform a comprehensive stock assessment it is vital that biological data from all life stages of the species be incorporated into the analyses. Issuance of an Exempted Fishing Permit would give Mississippi Department of Marine Resources (MDMR) access to Red Drum in later life-stages thereby ensuring a more robust data set. The lack of data for younger or older fish can render inaccurate estimates of growth parameters (Haddon 2001) used for developing the Age at Length Key (ALK). The existing data set contains only a poor representation of the mature, spawning-capable life stage of Red Drum and is completely void of any index of fecundity and diet composition for all life stages. Considering that Red Drum in Mississippi mature by age 6 at the latest (Murphy and Taylor 1990), and can live greater than 40 years (Murphy and Munyandorero 2009, Murphy and Taylor 1990), the existing data set is only representative of approximately 15% of the age classes for Red Drum. It is imperative that a more robust ALK, an index of fecundity, and composition of diet be determined to ensure reliable results from currently ongoing, as well as future stock assessments.

To provide collections for the needed analyses, vessels of the for-hire industry will be permitted one fish per person per trip from the Exclusive Economic Zone (EEZ), having no length restrictions, with a quota of 30,000 lbs. total harvest over two years (approximately 1000 fish per year). Anglers will be allowed to keep their fish upon completion of data collection and removal of tissue/hard parts needed for analyses. The quota is to be enforced via mandatory reporting in conglomeration with current monitoring that employs mandatory reporting techniques. Vessel captains will be required to apply for each trip and must report catch for every trip via mandatory trip reporting system already in place within Mississippi. If 50% of the quota is met early in the first year, adjustments will be made to ensure the maximum is not exceeded. All data collected within the EFP will be available for state based and federal stock assessments upon request.

Collection Focus and Analysis

Population Genetics: Molecular techniques will be used to identify possible meta-populations and genetic structure within the central Gulf of Mexico. After fish collection, a small tissue sample will be removed from the pectoral fin (~1cm³) of each fish and placed in preservation buffer (Seutin et al., 1991). The samples will then be stored (- 20° C) at The University of Southern Mississippi (Hattiesburg) for genetic analyses (mtDNA). Additional efforts will be made (tissue kits provided to vessel captains) for anglers to collect fin tissue from additional fish caught and released as this is not a lethal collection method.

Diet: Stomach contents will be collected from each fish and analyzed for prey identification as well as concentrations of stable isotopes. Tissue samples from each Red Drum will be removed, frozen (0° C), and analyzed at The Gulf Coast Research Laboratory (GCRL) for stable isotopes identification as well (Ute et al. 2005). Outputs from these analyses will be used to identify trophic placement of Red Drum and prey items. Findings of both stomach and tissue analyses will then be compared to elucidate any difference in the proportion of food items ingested versus items assimilated.

Age: Many of the 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 Drum 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 will be removed, allowed to air dry, and processed according to the methods set forth in “A Practical Handbook for Determining the Ages of Gulf of Mexico Fishes” published by the Gulf states Marine Fisheries Commission. These observed lengths and ages will be the inputs used in developing the ALK.

Histology: Sex ratios, maturation of oocytes as well as fecundity analyses will be addressed by removing the reproductive organs of the Red Drum. The entire reproductive organs will be removed, identified as male or female, and weighed. A subsample of the tissue (~10 grams) will then be placed in a cassette and stored in Gilson’s fluid. The cassettes will then be stored for further processing at (GCRL).

Literature Cited

- Comyns, B. H., J. Lyczkowski-Shultz, D.L. Neiland, C.A. Wilson. 1991. Reproduction of Red Drum, *Sciaenops ocellatus*, in the North central Gulf of Mexico: Seasonality and spawner biomass. Larval fish recruitment and research in the Americas: proceedings of the thirteenth annual fish conference, 21-26 May 1989, Merida, Mexico (Robert D. Hoyt, ed.). NOAA Technical Report NMFS 95.
- Gulf of Mexico Fishery Management Council. 1987. Amendment number 1 and environmental assessment and supplemental regulatory impact review and initial regulatory flexibility analysis to the secretarial fishery management plan for the Red Drum fishery of the Gulf of Mexico.
- Gulf States Marine Fisheries Commission. 2009. A Practical Handbook for Determining the Ages of Gulf of Mexico Fishes. *GSMFC*. Publication 167
- Haddon, M. 2010. Modelling and Quantitative Methods in Fisheries. Chapman & Hall/CRC, p 200.
- Linton, B. C. 2008. Recommended age composition and mark-recapture study sample sizes for Gulf of Mexico Red Drum. National Marine Fisheries Service, Southeast Fisheries Science Center, Sustainable Fisheries Division Contribution SFD-2008-018.
- Lohoefer, R., C. Roden, W. Hoggard, and K. Mullin. 1987. Distribution and relative abundance of near-surface schools of large Red Drum, *Sciaenops ocellatus*, in northern Gulf of Mexico and selected inland waters – A pilot study. Technical report.
- Murphy, M.D., and J. Munyandorero. 2009. An assessment of the status of Red Drum in Florida waters through 2007. Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute, St. Petersburg, FL. IHR 2008-008.
- Murphy, M.D., and R.G. Taylor. 1990. Reproduction, growth and mortality of Red Drum *Sciaenops ocellatus* in Florida waters. Fishery Bulletin 88:531-542.
- National Marine Fisheries Service. 1986. National Oceans and Atmospheric Administration, Department of Commerce, Secretarial Fishery Management Plan for the Red Drum Fishery of the Gulf of Mexico.
- Porch, C., M.R. Fisher, and L.W. McEachron. 2002. Estimating abundance from gillnet samples with application to Red Drum (*Sciaenops ocellatus*) in Texas bays. Canadian Journal of Fisheries and Aquaculture Science. 59:657-668.

- Powers, S. P., C.L. Hightower, M.J. Drymon, and M.W. Johnson. 2012. Age composition and distribution of Red Drum (*Sciaenops ocellatus*) in offshore waters of the north central Gulf of Mexico: an evaluation of stock under a federal harvest moratorium.
- Seutin, G., B.N. White, and P.T. Boag. 1991. Preservation of avian blood and tissue samples for DNA analyses. *Canadian Journal of Zoology* 69:82–90.
- Ute, J., K. Mintenbeck, T. Brey, R. Knust, and K. Beyer. 2005. Stable isotope food web studies: a case for standardized sample treatment. *Marine Ecology Progressive Series* 287:251-253.