Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

Red Porgy Reproductive Analysis

1.2. Summary description of the data:

Protogynous fishes are often assumed to be more sensitive than gonochorists to exploitation, primarily because of potential sperm limitation and/or social disruption of mating if larger, mostly male individuals are selected for.

Almost 4000 red porgy were collected year-round, Mar 1998-Sep 2001, in the NE Gulf, primarily using standardized hook and line gear in depths of 22-92 m. Most (n=2,586) were collected at 9 sites off NW Florida in 30-68 m sampled repeatedly. Fish were aged using whole and broken and burned sagittae, and sexed and staged histologically (females and transitionals)or macroscopically (males). An early objective was to determine if the behaviorally-related size and/or sex selectivity observed in other protogynous species occurred in red porgy, i.e., were larger individuals or males at a site more aggressive and more likely to bite a hook and be caught before smaller ones or females. Non-parametric runs tests of ordered size and sex data showed no evidence of such selectivity, indicating that hook-and-line gear is a fair way to sample red porgy. More importantly, any evidence of truncation in size structure or skewing of sex ratios in exploited populations should not be attributed to greater aggression or '"hook attraction" in males but can be easily explained as the results of simple size-selective harvesting.

Histological evidence indicated that red porgy in depths of 20 to 78 m in the NE Gulf spawn wherever they occur, primarily Dec to Feb. Estimated size and age at 50% maturity for females was 211 - 216 mm TL and <2 yr. Sex change occurred wherever they were found, almost exclusively Mar-Nov, and across a wide range of sizes (206-417 mm TL) and ages (2-9 yr), strong evidence it is socially controlled. Red porgy are permanently sexually dichromatic. The premaxilla is green or bluish-green in males and pink or reddish in females. Observations of captive fish suggest they pair spawn. Seasonal patterns in catch rates and sex ratios, and widespread occurrence of spawning females indicated that red porgy do not form large, predictable spawning aggregations.

There was no evidence found that protogyny or their reproductive ecology might 1)

explain the apparent crash of the red porgy stock(s) in the SAB or 2) make the species more sensitive to exploitation than gonochorists - in fact they are probably less sensitive in some cases. Many aspects of their biology and behavior, including widespread spawning grounds, no tendency to form spawning aggregations, absence of behaviorally-related size or sex selectivity, socially controlled sex change, co-occurrence of sexes year-round, and an extended period of transition, should stabilize or enable rapid compensation of sex ratios (preventing sperm limitation or disruption of mating). Socially controlled sex change also enables size and age of transition to slide downward as fishing truncates the size structure, similar to the declines in size and age at maturity seen in many gonochorists. Several population traits differed significantly among the 9 regular sites (which ranged from 1.3 to 58.4 km (0 = 28.7) apart), including size and age composition (K-S 2 sample test);

means ranged from 261 to 309 mm TL and 2.7 to 4.1 yr. Size at age varied considerably, primarily because of significant differences among sites. The relationships of mean size at age among sites were consistent across ages and temporally stable. Robson-Chapman maximum likelihood estimates of annual survival ranged from 38 to 65 % among sites, and 95% CI?s did not overlap for 6 of the 8 sites with estimates. Logistic regression indicated that the proportion of females changing sex differed significantly among sites (medians: 12 - 33%) and depths.

Sizes and ages at transition also varied spatially, with site-specific means of 266 - 313 mm and 3.1 - 4.6 yr. Sex ratio was yet another demographic that differed among sites: 28 of 36 pairwise comparisons were significant (log. regress.).

These persistent differences in population traits at such a small scale likely reflect phenotypic, not genetic, effects. Two factors - spatial heterogeneity of their environment and site fidelity - probably explain most of those differences. The live bottom habitat preferred by red porgy is widespread but very patchy. These patches, grossly similar, have variable hydrological, geological, biological, and ecological characteristics; and they range from unexploited to heavily exploited. Biological and ecological characteristics likely to vary among patches include density, predator and prey composition and density, and competition. Adult redporgy exhibit considerable site fidelity, so once recruited to a given patch of habitat, they are exposed to a unique suite of many factors which could affect growth, mortality, and reproduction. The consistent, persistent, significant differences in size and age structure, growth, xvi mortality, transition rates, size and ages at transition, and sex ratios among sites separated by only 10?s of kilometers strongly suggests that red porgy in the NE Gulf have a complex population structure composed of many local subpopulations. These subpopulations closely resemble Crowder et al. (2000) definition of sources and sinks areas of differing demographic rates dictated by underlying differences in habitat quality?. This complex structure is not the classical metapopulation of Levins (1970), i.e.,a A population of populations that go extinct and recolonize @and which are exposed to the same conditions in each habitat patch. It does, however, fit the broader definition of metapopulation espoused by Hastings and Harrison (1994), Hanski and Simberloff (1997) , and Kritzer and Sale (2004), which relaxes the requirement for extinctions and

recolonizations and does not require uniform conditions across patches.

Whether the population subunits are called local subpopulations, sources and sinks, or members of a metapopulation, the critical point is that many may have significantly different demographics and life history traits, which has potentially significant implications regarding stock assessment and management of red porgy. Data pooled from several subpopulations may yield skewed parameter estimates, which in turn could bias stock assessments and the models used to predict responses to exploitation. It could also introduce excessive variability to the parameter estimates. Such complexity could certainly frustrate and confound the efforts of those trying to assess the status of these stocks and predict the effects of fishing on them, as it requires examination of population biology at much smaller spatial scales than typically done and use of more complex, spatially-explicit population models.

It is likely that small scale population complexity has played some part in the failure of some southeastern U.S. reef fish fisheries to respond to management measures in recent years

1.3. Is this a one-time data collection, or an ongoing series of measurements?
One-time data collection

1.4. Actual or planned temporal coverage of the data:
1998-01-01 to 2001-12-31, 1994-01-01 to 1994-12-31, 1997-01-01 to 1997-12-31

1.5. Actual or planned geographic coverage of the data:
W: -88.34, E: -83.66, N: 30.24385, S: 25.851
northeast Gulf of Mexico

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
Table (digital)

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
Chris L Gardner

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:

2.4. E-mail address:
chris.gardner@noaa.gov

2.5. Phone number:
850-234-6541 x 262

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:
Chris L Gardner

3.2. Title:
Data Steward

4. Resources
Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?
No

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):
Unknown

5. Data Lineage and Quality
NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible
(describe or provide URL of description):
Lineage Statement:
Describe in referenced documentation (Devries PhD Thesis)

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):
All fish were separated by collection site, placed on ice, and returned to the laboratory

for processing the next day.

In the lab all fish were measured to the nearest mm total length (TL) and sexed macroscopically, after which histological samples were taken from the gonads of any identified as female or transitional. Final determination of sex was based on histological findings if available.

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

No

6.1.1. If metadata are non-existent or non-compliant, please explain:

Missing/invalid information:
- 1.7. Data collection method(s)

6.2. Name of organization or facility providing metadata hosting:

NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:

https://www.fisheries.noaa.gov/inport/item/8548

6.4. Process for producing and maintaining metadata

(describe or provide URL of description):

Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access

NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

No

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

No

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

NOAA Data Quality Act Documentation and Pre-Dissemination guidelines

7.2. Name of organization of facility providing data access:

Southeast Fisheries Science Center (SEFSC)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:

https://grunt.sefsc.noaa.gov/parr/8548.zip

7.3. Data access methods or services offered:

Contact the individual identified as the distributor for this dataset. Please include the title of the dataset and the name of the data steward when requesting a copy of this data.

7.4. Approximate delay between data collection and dissemination:

N/A

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:

(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

NCEI_MD

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):

Panama City Laboratory - Panama City, FL

8.3. Approximate delay between data collection and submission to an archive facility:

N/A

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?

Discuss data back-up, disaster recovery/contingency planning, and off-site data storage

relevant to the data collection

N/A

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.