Red Drum Technical Committee

May 24, 2007
Charleston, South Carolina

Meeting Report

Committee Members Present

Mike Murphy (FLFWCC)
Spud Woodward (GADNR)
Gabe Gaddis (GADNR)
Charlie Wenner (SCDNR)
Helen Takade (NCDMF), proxy for L. Paramore
Joe Grist (VMRC)
Wilson Laney (USFWS)
Ray Rhodes (Col. of Charleston

Other Participants

Nichola Meserve (ASMFC)
John Carmichael (SEDAR)
Chris Young (FLFWCC)
Doug Haymans (GADNR)
Mike Denson (SCDNR)
Tanya Darden (SCDNR)

Meeting Overview

The Red Drum Technical Committee met in Charleston, South Carolina for one day with the following objectives: review the benchmark stock assessment process and develop a preliminary assessment timeline; customize a standard data availability template; review state data, discuss data deficiencies, and identify methods for improvement; and continue a discussion of the FMP SPR objective. Tasks assigned at the meeting are ***italicized and bolded*** in the text.

Review Benchmark Stock Assessment Process

The TC discussed the SEDAR stock assessment process, which is structured around three workshops (data, assessment, and peer review) that result in a more rigorous testing of the data and assessment methods. The peer review panel will consist of three individuals from the Center for Independent Experts. While authorities on assessment techniques, they will not likely be experts on red drum.

The TC reviewed how this benchmark assessment would work with both a Gulf of Mexico and Atlantic coast assessment going through SEDAR. While the Gulf and Atlantic assessment teams will share workshops, the assessments will be dedicated to separate areas and will result in two assessments independent of one another and judged on their own merits. Unlike on the Atlantic coast where the Commission takes the lead on the assessment through its technical and stock assessment subcommittees, the Gulf assessment is done at the federal level with the SEFSC producing the assessment. The two assessment teams have taken different approaches in the past, with the Commission TC using a VPA and the Gulf team using a catch-at-age approach. Although disparate, the two assessments will have similar data deficiencies and both assessment teams would likely benefit from a joint meeting. It was suggested that a joint meeting take place, perhaps during the ASMFC September 17-20 TC meeting week, with the TC meeting with folks such as Clay Porch, Stu Kennedy, Steve Vanderkooy, and John Carmichael. The TC will assess its need for such a meting as the assessment process continues.

Develop a Preliminary Stock Assessment Timeline

The TC developed a preliminary timeline for the stock assessment based on tentative workshop dates from John Carmichael. By May 2008, SEDAR is expected to propose the actual workshop

dates, which will take into account Council and Commission meetings. The scheduling of the workshops means that the assessment will use data through 2007. All data, analyses, model runs, working papers, etc. for the assessment will be housed on the secure storage site managed by ACCSP (ftp://tautog.accsp.org/). All materials should be sent to Nichola for posting to the site.

Preliminary Stock Assessment Timeline

Date	Objective
May 24, 2007	**Technical Committee Meeting.** Review SEDAR process and approve preliminary timeline, discuss data availability and deficiencies, approve data availability template[1], determine data holders, designate a lead data compiler.
June 2007	Data availability template sent to data holders with clear submission deadline.
September 2007	TC/SASC evaluates data needs compared to the available data (from submitted templates), finalizes a data collection template[2], and sends it to data holders as appropriate. **TC/SASC Meeting**: Week of September 17-20.
December 2007	Lead data compiler receives completed data collection templates and compiles data. Data made available to Stock Assessment Subcommittee. **Tentative SASC Meeting**.
January – December 2008	SASC develops working papers and preliminary analyses[3] and prepares presentations to bring to Data Workshop. Materials compiled on CD-RW by data compiler.
July 1 2008	Compliance report due date and deadline for submitting 2007 assessment data.
Aug/Sept 2008	Develop Terms of Reference.
October 2008	Board approves Terms of Reference.
Late-January 2009	Data Workshop **(TC, SASC, ASMFC Staff, other invited/interested parties)**
Early-February 2009	Data Workshop products finalized by the TC via e-mail and submitted to Assessment Workshop participants.
Mid-February – April 2009	Lead modeler(s) develop documents describing reasoning and methodology of proposed assessment technique(s).
Mid-May 2009	Assessment Workshop **(SASC, TC chair & vice-chair, ASMFC staff, invited parties)**
June 2009	SASC submits completed Stock Assessment Report to the TC for approval.
July 2009	TC approves Stock Assessment Report.
Mid-August 2009	Peer Review Workshop
September 2009	Board approves Stock Assessment Report and Peer Review.

Overview of State Red Drum Data for the 2009 Stock Assessment

To assist in identifying data deficiencies, state representative were first asked to provide a brief overview of available state data for the assessment and any new studies on red drum. Each of the presentations are available for the TC members on the ftp://tautog.org website; others can contact nmeserve@asmfc.org for a copy is desired.

Florida – Mike Murphy

Fishery Independent Data

Florida has conducted random sampling for otoliths and total length measurements from 2001 to 2006. Age data are available for 1981-83 from a life history study and for 1984-89 from various

[1] The standard data availability template is found in *Benchmark Stock Assessments: Data and Assessment Workshop & Peer Review Process* (ASMFC 2007, p.39-46, available on the ASMFC website).
[2] An example of the data collection template is an Excel workbook used for collecting annual striped bass data.
[3] Guidelines for Data Workshop working papers and preliminary analyses are on pages 30-32 (ASMFC 2007).

tagging programs. Data are available on adult age structure for 1987-88. A recruitment index (fish < 100mm) conducted in December through January/February covers 1990 to 2006. A generalized linear model is used. In recent years, 300-400 sets per year have been made with a good number of fish in the recruitment window. A 183m seine index conducted since 1997 captures all sizes of fish. Sample size is in the 400s and 500s for the last several years. This index proved very important to drive population size in the last state assessment. There is also a number of west coast Florida surveys and tagging programs that may provide some information and the source/type of information will be collected through the data availability template.

Fishery Dependent Data

MRFSS length samples are available from 1982 to the present. Sample size in 2005 was 215, although in the late 1980s some years have few samples. In recent years, Florida has augmented sample size putting it mostly in the 200s for last 6-7 years. Another recent (2005-06) program asks licensed anglers each wave to measure all the fish they release in one trip. Sample size for the two years is 25. Responses have hinted that not all released fish are in the slot limit. In the last Florida stock assessment, several different scenarios for recreational released fish lengths were used in the model. Mike indicated that Florida's biggest deficiency is the scarcity of age samples from the fishery; nearly all ageing data is from the fishery independent surveys.

Georgia – Gabe Gaddis

Fishery Independent Data

Georgia has three surveys that produce data on red drum. The first two are entanglement gear surveys, which use a random stratified sample design and date back to 2003. A gill net survey is conducted in the summer months and a trammel net survey in the fall. These track young-of-year recruitment in two estuaries (although Georgia is hoping to expand this to three estuaries.) The other survey is a longline survey targeting fish in several estuaries from April to December. Adult red drum (≥12") are captured and tagged out to 12 miles.

Fishery Dependent Data

In addition to the MRFSS data, there is also a carcass recovery project started in 1997 that collects otoliths.

South Carolina – Charlie Wenner

Fishery Independent Data

A trammel net survey from 1991 to the present collects fish from 9-37" using a stratified random design. Samples are collected monthly in eight main sampling areas using standardized gear and methodology. Staff attempt to make 8-12 sets per strata per sampling effort. Red drum are tagged (internal anchor or dart tag depending on size) and released. An efficiency study showed that about 30% of red drum in the sampling area are caught in the trammel net. CPUE is produced for red drum by age class (ages 1-4). Data are adjusted to account for stocked fish contribution, which in some years is 15-40%. An electrofishing survey has been used in transition zones not normally sampled from 2001 to the present. This also uses a stratified random design. All fish are tagged and released. Red drum make up about 4% of catch by number of fish, and rank 4th by weight. CPUE is produced (effort in distance unit). A longline survey in operation since 1994 collects fish between 29-47". Fish are measured and checked for all tags, fin clips are taken for genetic sample (for stocked vs. wild analysis), and given several types of tags. A study was conducted to analyze tag retention by tag type. One interesting result was that 18% of recaptured fish had lost all tags, assuming that pit tags are permanent. From all these sampling methods, about 35,000 red drum have been tagged to date. South Carolina has estimated tag shedding and handling mortality rates. Fish movement analysis showed that most

fish stay close to tag site. Charlie noted that red drum violate some of the assumptions in tagging models. South Carolina also has an age-length growth curve produced from collected otoliths and lengths. Red drum grow very fast in the first five years, then display very slow growth. These tagging data could be used to estimate B2 length frequency distribution as done by NC in its last assessment (see below). However, it was uncertain if DNR staff will be able to do this, and the NC State student is no longer available.

Fishery Dependent Data

In addition to MRFSS data, South Carolina has a carcass collection program to collect otoliths and there are about six tournaments held per year that encounter red drum and these are processed by the DNR. South Carolina has also conducted angler surveys, asking participants if they practiced catch and release fishing, targeted red drum, and used what type of hook and bait on their last trip. In conjunction with this survey, SC DNR conduced some mortality studies, investigating percent mortality by hook type and location. It was estimated that the use of non-offset circle hooks would reduce red drum release mortality by ~80%. The department also has new release mortality rates for adult releases (assume zero percent in assessments now). Charlie's presentation also highlighted much other information on red drum, for instance habitat and food preference, spawning areas, and behavior. One thing Charlie noted was that the states need to standardize their length data, because various measurements are taken.

North Carolina – Helen Takade

North Carolina recently updated the northern region stock assessment (NC and north). This updated Vaughan and Carmichael's 2000 stock assessment, but included several new analyses. The assessment included data from nearly all NC's sources that will be available for the 2009 stock assessment.

Fishery Independent Data

North Carolina has a juvenile abundance index with data from 1991 (missing one year of data). This index was used in the assessment but is highly irregular. An independent gill net study (IGNS) was started in 2001, which samples age 1 and 2 fish. Although the time series is short, it appears to be tracking pretty well. A student at NC State is analyzing how well the IGNS tracks with other indices and estimated stock abundance. This should be available for the 2009 assessment. There is no adult index yet and the longline survey scheduled to start very soon (after resolution of a permitting issue) will not be useful for the 2009 assessment. There is a tagging program in North Carolina and a fellow at NC State used these data to investigate age of out-migration for red drum, i.e., to observe shifts in selectivity with management changes and estimate relative selectivity for age 3 fish compared to age 2 fish. The resulting estimate was not far off from the estimate used by Vaughan and Carmichael for the middle time period. Helen noted two new release mortality studies from 2002 and 2007 that have both higher and lower estimates for release mortality than the 10% used in the previous assessment. The 10% estimate was used in the recent assessment because the lower rates may have been optimistic and 10% fell in the middle of the other estimates' range. A net index near Pivers Island was indicated as a potential data source for the next assessment, as was a Rutgers survey (which should be familiar to the eel TC). NC DMF also has any data for red drum caught during the winter striped bass cooperative tagging cruise. Wilson indicated that probably between 200 and 300 red drum have been caught over the cruise's 20 year history.

Fishery Dependent Data

The North Carolina Trip Ticket Program collects commercial fishery data. This program shows that the vast majority of landings are from estuarine gill nets, which is also where most biological samples come from. For its assessment, NC was unable to determine the magnitude of commercial discards, which is a large deficiency in the assessment. There is now a small amount of observer coverage in the Pamlico Sound (as a result of turtle regulations) and the state also started some independent gill net work in 2000 that may be useful for discard estimation in the 2009 assessment. For the recreational fishery, North Carolina has the usual MRFSS data. To improve upon current recreational discard length estimation methods, NC had a fellow at NC State use volunteer red drum tagging data that started in the mid-1980s to run a model estimating length frequency of fish caught and released by anglers. The goal was to run the model for each management period, but it was limited to the late management period because there was not enough earlier tagging data. The analysis produced some releases outside of the slot limit, which there was not evidence for before. The release frequency had to be applied over the whole late period; it couldn't be broken down by year. Despite several assumptions in the model, NC considers it an improvement of the inference usually made for B2 length frequencies.

Virginia – Joe Grist

Fishery Independent Data

Virginia has tagging data since the 1990s collected through a cooperative effort of VIMS, VMRC and saltwater anglers. Over 4000 red drum were tagged in 2006, although the number tagged per year varies from the hundreds to the thousands. Length frequency data are available for all tagged fish. A good number of fish below the slot limit have been tagged, as well as a good bit around 44 inches. In the recapture data, there are some large migrations with fish moving an average of 25 miles per day and up to 40 miles per day. VMRC is starting a carcass collection program and is conducting online surveys to get catch and release length data, because they have little fishery independent data. There is also citation program data available.

Fishery Dependent Data

Commercial data has been collected with trip tickets since 1994. Landings are separable by gear. Length frequency data has been collected since 1989 and age data from 1999. Red drum is not a common fish in the commercial landings. The hope is to have more sampling for red drum in the future. MRFSS provides recreational data.

Other Data

Committee members indicated that there is no SEAMAP data for red drum and very little MARMAP data, which will not be useful.

Committee members will be responsible for ensuring that the data availability template is sent to the appropriate contacts for all potential data sets. Any new papers on red drum useful for the assessment should be sent to Nichola and she will put them on the secure server.

Identification of Data Deficiencies for the 2009 Stock Assessment

Having reviewed the state data sources, the TC went on to identify data deficiencies and other potential problems. These included:

- Lack of information on the adult population
- Lack of data on commercial discards
- Lack of length-frequency data for recreational discards
- Potential for changing natural mortality

- North-South split and state-specific management regimes

The 2009 assessment will include data through 2007. This means that there is limited time to develop, implement, and/or complete projects to collect data to address deficiencies. However, the TC developed several ideas for making improvements to the available data in the time allowed.

Adult Population
The longline survey was designed to provide information on the adult red drum population, which is currently data poor. The longline survey will ideally be able to track relative abundance of young-of-year and juveniles to relative abundance of adults, help indicate the appropriateness of the 30% SPR goal, and provide adult fish samples for other projects. However, the longline survey will not be able to provide an adult index for the 2009 stock assessment, so the TC questioned how else the longline survey might be able to improve information on the adult population.

Given that there is limited data on the age structure of adult red drum, the TC determined that the longline survey and other sampling programs could provide a useful snapshot of adult age distribution in the next year through otolith ageing of captured adult fish. (B2 length estimates are of limited use because the growth curve is very flat after age five.) Additional sampling may provide evidence for greater relative abundance of more recent year-classes that have benefited from recent regulations. The TC concluded that 200-300 fish should be collected between July 1, 2007 and June 30, 2008 (the next "bass year") off of each state, Virginia through Florida. (If continued in future years, it may be possible to collect fewer fish per state or region. The actual timing of sampling in the bass year will differ by state according to fish availability.) Sampling should be designed such that fewer than 30 fish are sampled and sacrificed from any single school encountered in near shore or offshore adult habitats. Each sacrificed fish would be utilized to the fullest extent, providing length measurements and age structures, and tissues for examination of sex, maturity, possibly fecundity, parasite presence, heavy metal contamination, and genetic studies. SC DNR, and specifically Tanya Darden, will take the lead on the genetic studies and distribution of fin clip sampling kits. The TC concluded that the benefits to the assessment far outweigh any small effect this sampling program would have on the adult red drum stock in these regions.

The TC determined that Nichola will draft a memo (to be approved by the TC) to the South Atlantic Board indicating the TC's intent, requesting permission to proceed with the sampling program, and also encouraging state efforts to meet other data deficiencies (ex. on discards).

Recreational Discards Length Frequency
Past assessments have used various scenarios to model recreational release length frequency, including assuming zero release mortality and assuming 10% release mortality with several variations for the length frequency distribution. The use of tagging data to estimate selectivity at length for the B2 catch as used by NC should also be considered for the 2009 stock assessment. Several other states have tagging data that could be applied similarly. However, it will take finding staff capable of the analysis.

Charlie indicated that he has some funding available for collecting length measurements of B2 fish and he asked for input from the TC on how to address the general public. Joe and Wilson

suggested the online survey that Virginia plans to have ready in one month that could be expanded to other areas. For this, volunteer anglers go to a website, create a username and password, and then enter discard data after a trip. While Virginia plans to eliminate poor data by identifying and removing outliers, other methods to prevent misuse of the site were discussed, such as requiring a license number to create a username. Joe indicated that this might be something possible for the future when funding is available. A volunteer angler program such as recently started in Florida was also suggested, where anglers are asked to report lengths of released fish after a trip. SC DNR could visit angler clubs and distribute journals for collecting this information. Even one year of data could prove useful for the assessment. An incentive such as a raffle for a new fishing rod would help to increase volunteer participation.

Natural Mortality (M)

The TC saw a need for the SASC to review M rates in light of some evidence suggesting a possible increase (for example, from increased bottlenose dolphin predation). It was noted that Rob Latour used red drum tagging data in his PhD thesis and produced estimates for M. He used tagging data specific to Charleston Harbor, but SC DNR has data for many areas that no one has analyzed yet. Nichola indicated that Gary Nelson had programmed an instantaneous rates model that can estimate M into AD Model Builder for striped bass tagging data. The TC agreed that it was worthwhile to look into applying models to the tagging data to estimate M for the next assessment as the data is available, there is time, and there may be some money for it. (Charlie suggested that SC DNR may be able to provide some funding.) It was cautioned that M estimates from tagging data have a potential for upward bias. ***Joe Grist will query VIMS personnel for information and interest, as he works frequently with John Hoenig.***

North-South Split

Starting with the 1996 assessment, the stock was split into two at the North Carolina-South Carolina border and two assessments were produced. This was justified partly by restricted red drum movement, partly based on differences in fisheries, and partly on differences in management regimes. The TC discussed if biological data still supported the split in the assessments. Joe commented that tagging data definitely links Virginia and North Carolina together. Charlie indicated that some South Carolina fish move into North Carolina up to Cape Fear, but not further than that. Mike reported that in Florida, fish tagged haven't gone further than St. Augustine, although there is some anecdotal evidence from shrimpers that observe northern spring and southern fall runs. No TC members believed that fish go more than one state away. Mixing between the Gulf and Atlantic stocks is likely non-existent because the stocks are genetically discernable.

In a note to the TC, Doug Vaughan questioned the split based on changes in management regimes. Whereas South Carolina and Georgia had similar regimes previously (and Florida, although different, was lumped in for convenience), the two states now have divergent management measures. Whereas Florida has conducted several state-specific assessments, South Carolina and Georgia have not. He indicated that they may need state-specific assessments.

Data availability template for the 2009 Stock Assessment

The TC reviewed the data availability template within the 2007 edition of the ASMFC document "Benchmark Stock Assessments: Data and Assessment Workshops & Peer Review Process." The TC determined that the data availability template should be used to make the assessment process transparent and produce the fullest data inventory. The TC did want to make several

modifications to the template to ensure that data availability information will be collected for regulatory histories, discard mortality studies, natural mortality studies, stock enhancement projects, tagging studies, stock identification studies, citation programs, historical information, and effort data. ***Nichola will work with the TC to revise the template accordingly before it is sent to the TC/SASC members for filling in and further dissemination. When complete, the template will be distributed to the TC members (as well as an appropriate person in Maryland), who will be responsible for further distribution of the template to potential data holders within the state.***

The TC discussed how socio-economic data will be involved in the assessment process. Ray Rhodes argued that socio-economic data can provide important information such as how to classify a directed trip and how effort may change in the future. The TC agreed that socio-economic data holders should be asked to complete the data availability and collection templates and the TC should compile these data. Doing so will lead to a more comprehensive data inventory and the assessment will benefit from having a very transparent data collection process. Socio-economic data will likely come into the most use as the TC produces projections for the fishery, which is the type of analysis that the Board will want. Ray suggested that some socio-economic members come to the workshops to provide input on the human dimension of the fishery. It was noted that the data availability template does not have a sheet tailored to collect socio-economic data. ***Nichola and Ray will revise the data availability template to collect information for socio-economic data sources.***

Data Collection Template for the 2009 Stock Assessment

The TC decided that it would wait until the next meeting (probably in September) when the data availability templates have been completed, to customize a data collection template. The TC may use the striped bass data collection Excel workbook as a platform to develop the template.

Discuss FMP Spawning Potential Ratio Objective

At its last meeting, the TC discussed the idea of researching new literature to see what reference point is most appropriate for red drum. The TC members did not come back to this meeting with any new literature. John Carmichael suggested that there is more anecdotal evidence that the SPR goal should be higher (40% or 50%). The TC mentioned how SPR goals tend to get pushed up to be more cautionary when information from one fish is applied to another with a different life history. The TC questioned how else they could investigate the appropriateness of the SPR goal, such as with a field study. Such experimental approaches would be difficult for law enforcement and would still require the application of information for one estuary's population to another's, so the TC determined that the literature was the best way to consider SPR goals. The TC agreed that one Term of Reference for the stock assessment should be to evaluate the SPR objective, which might result in some useful recommendations from the peer review panel, and that the assessment should include calculations for a number of different reference points. It was pointed out that SPR and escapement have mistakenly been used interchangeably by the public and that one aim of the assessment process should be to re-educate stakeholders. If any TC members find new literature on SPR goals, it should be shared with the group.

Other Business

Seeing as there was no other business, the Technical Committee Meeting was adjourned.