

Chairman's report of a meeting under the South-East Data and Assessment Review programme to review assessments of the Goliath Grouper in southern Florida and of the Hogfish in Florida.

Report prepared for the Centre for Independent Experts.

**Michael C.S. Kingsley
February 2004.**

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CHAIRMAN'S REPORT

1. Synopsis/summary of the meeting – to provide context for the comments rather than to rewrite the summary report.

The meeting was held at a hotel in Tampa, Fla. The meeting convened at 2 p.m. on Tuesday 27 Jan.

Tues. p.m.

The meeting started with call to order by the Chairman, after which John Carmichael (SEDAR Coordinator, who arranged the meeting) described the process; and went on to give a round of introductions.

As well as the Panel members seated around the formal meeting table, there were rows of seats at the back of the room, occupied by various people whose function I was not clear on. It turns out that they were a mixture of 'spare' scientists, 'spare' staff members of the FMCs, members of the public, divers, fishermen, and lawyers and so on. They had a very diverse set of interests and possible contributions to make to the meeting.

The meeting proceeded to the presentation of documents on Goliath grouper by Clay Porch. At the Chairman's request, Dr Porch started by going through the documents on data: dive surveys and E.N.P. creel surveys as indices of abundance. The intention was to take only questions of clarification in this round. In fact, there was quite a lot of questioning of substance, in particular whether counts made in the dive surveys are representative of the abundance over the range of the species. A certain amount of this type of questioning was permitted, although it slowed the process a good bit. Clay Porch then presented the assessment document. Again, questions of clarification were invited, but some questions of substance were permitted. There was a lot of questioning of the fishing mortality pattern assumptions, e.g. that 1950 was a reasonable starting point, that fishing mortality had in fact dropped to zero with the moratorium, the pattern of fishing mortality when serious exploitation started.

There were a number of questions and comments raised from the 'back of the room', i.e. either from members of the public, more or in some cases less well informed, from loose scientists either from NMFS

or from the Florida FWCC or from Council staff members. The Chairman usually did not know before recognising a speaker where he was associated.

There was little questioning of the assessment model. Clay Porch presented an improved version, in which the relation between the parameter CVs was altered. We reached this point just before 5 p.m. In terms of the validity of the assessment and some of the 'data-free' assumptions that it included, it was decided that we would then take the short remainder of the afternoon to discuss possible sensitivity runs that might be made with modifications of the model, with the understanding that if, for example, the meeting decided that the basic abundance-index data was unsound, these extra runs might be wasted work. On that basis we had $\frac{3}{4}$ hr discussion of these assumptions, and recommended testing three possibilities. One was that the starting point for a pristine population was 1900 instead of 1950. A second was that fishing mortality dropped in 1990 not to zero but to 10 or to 20% of its value before the moratorium. A third was a change in the length-selectivity curve in the fishery before the moratorium.

Tues evening.

I started drafting the consensus summary report.

Wed. a.m.

The meeting proceeded to substantive discussion of the data. There was lots of discussion of the first two points in the DeMaria series, ending with a reasonable decision, to include 1983 but exclude the 1982 data. There was less discussion of the other two series. All data series were accepted for the assessment. We proceeded to substantive discussion of the model and the assessment. Results of sensitivity runs were not quite complete, so we took an early lunch at 11.30 while the presenter finished the runs.

Wed. p.m.

After lunch we continued discussion of the model and results, which took too long and put us behind.

Discussion focused most on the effect of the moratorium, which was significant in estimating rebuilding. There was a lot of discussion, because we had difficulty in reaching any kind of decision for lack of data. We decided to use 90% and 99% moratorium effectiveness as endpoints and asked for runs with those endpoints. Other changes (sensitivity runs) made some difference, but were not highly significant. The 1900 starting point for the historical data series was difficult to deal with because there was so little data that far back.

We stopped our discussions at about 2.30 and took a protracted break while we decided what to do next. We worked on the consensus summary report, partly drafted the previous evening. Starting about 3 pm we put the text on the projector and worked through it paragraph by paragraph and ended up with an agreed text which answers the Review Panel's terms of reference as provided by CIE to me. We didn't at this time make much progress with the Advisory Report, because the CIE terms of reference were not very helpful in setting up the template used by the Councils.

Wed evening.

I worked that evening with the SEDAR Coordinator to draft the advisory report

Thursday a.m.

The meeting started on the hogfish assessment, in the morning with presentations of the data series and assessment with questions for clarification. We started with presentation of the data from the assessment document (first 21 pp.) The presentation by Stephen Smith was slow and poorly prepared. We then allowed two short presentations from Underwater Clubs who wanted to present their views on the state of the stock. Then before lunch the assessment was presented with questions for clarification. There was some discursive treatment, but it was not too bad. We broke for lunch 15 minutes late.

Thurs. p.m.

After lunch we went into the data in detail, with a lot of discussion of the MRFSS data, commercial trip ticket data, and the RVC survey. The process was very slow because Smith tends to be a bit long-winded. We got through all that by about 4 pm. We then had very quick verbal presentations of the headboat (creel survey), Biscayne N.P. (creel survey) and Dry Tortugas (diver visual survey) data, all used only for length distribution. These data sets were accepted quickly and we went into substantive discussion of the assessment. There were lots of unexplained details and lots of errors, and the document is wrong in many places. However, the Panel wasn't obviously finding serious errors in the model, in spite of all the problems with the documentation.

But the Panel suggested two substantive changes in the treatment of data, in one case leaving out a lot of effort data that had been used in catch-effort indices. This made it impossible to accept the quantitative conclusions of the assessment, and we could not ask for a new one. The Council asked if it could get qualitative advice on the basis of the existing assessment.

We stopped the meeting at 6:30, expecting to start the next morning with a final review of reports on Goliath grouper and then go into drafting the consensus summary report on hogfish. When we have done that, we will probably try to draft the advisory report on hogfish.

Debra Murie has done the shopping list of improvements to the assessment presentation.

Thurs evening.

I started drafting the hogfish consensus summary report.

Friday morning.

First we went through the goliath grouper report and also the advisory report, as separate documents. Then we proceeded to finish the drafting of a consensus summary report on the hogfish assessment. Jay Rooker had drafted an Advisory Report on the hogfish. Between 12:05 and about 12:20 Jerry Ault made a short supplementary presentation on the hogfish modelling, with explanations of some details that were not well documented in the assessment document.

After lunch, we revised the hogfish documents, paragraph by paragraph through the consensus summary report, and finished revising that report by 2.30. We finished the meeting by revising the advisory report, paragraph by paragraph, by 15:06.

On Saturday, I traveled to Montreal.

The goliath grouper report was first sent to the Panel members for review on 4 Feb; the hogfish report was first sent for review on 6 Feb. On 7 Feb. my e-mail server went down, and on 8–9 Feb. I traveled home to Nuuk.

Lots of good and helpful comments were received from Debra Murie, Julie Neer, and John Wheeler. John Carmichael provided useful input to the status report with the different benchmarks for the different FMCs. John Brodziak gave an indication that he read the reports. Ralph Allen has provided no comments, at least on the Grouper report. Overall, there were very few significant comments.

2. Views on the meeting process, including recommendations for improvements on:

Meeting process

The meeting process went well. We tried to separate questions for clarification on all the documents before proceeding to substantive discussions. Deciding (with the help of the staff members present) when and how to handle questions from the public and the other people present who were not members of the Review Panel was a sensitive issue. The Chairman was materially aided by the guidance given by John Carmichael—to whom a special thank-you—and other staff of the Fisheries Management Councils, and by the uniformly high standard of behaviour among presenters, panel members, and members of the public.

On the whole, I thought the meeting was orderly, there was little overtalking, people seemed satisfied that they were getting adequate recognition from the chair, and so on (but see below). Several people, especially members of the public, spontaneously expressed satisfaction with the conduct and outcome of the meeting.

The outcome of the meeting

The outcomes of the meeting were as good as could have been expected given the inputs. We did a good job on the goliath grouper, and produced a thorough review of the data and the assessment and an

advisory report which, given the problems associated with assessments of fish stocks that are under moratorium and therefore lacking fishery-dependent data, was reasonably well grounded.

The review of the hogfish assessment was seriously limited by the quality of the assessment document, which was not as high as could have been desired. Answers to questions on the assessment tended to be discursive; but overall the Panel came to the conclusion that the assessment did not have many serious fundamental problems. Two that appeared to be significant were the inclusion of angling trips in the CPUE measures of abundance, especially in the MRFSS data, and the unstated, and possibly invalid, assumption of stationarity in the stock when calculating mortality from mean length. The Panel was clearly of the opinion that the documentation of the assessment was inadequate and made a number of requests for improvements.

As far as I could judge, many, or most, of the members of the public who were present went away with the opinion that the assessments had been reviewed with appropriate thoroughness and lack of bias.

However, one week after the meeting, Ms Marianne Cufone (Panel Member; The Ocean Conservancy Florida) sent me an e-mail stating, not very clearly, dissatisfaction with the meeting, which she later expanded to complaints that she had been confused about what we were talking about, had received demeaning answers to questions, and had been overborne by more vocal and forceful Panel members. She said that she would be writing a letter, to whom she has not said, that would be co-signed by other members, but again, she has not said who. She attended one day of the meeting, and made no complaints that I was aware of at the time.

Similarly, Mr Don DeMaria (Panel Member; South Atlantic Fishery Management Council Advisory Panel), 14 days after the close of the meeting and 9 days after the sending of the report (which had in any case been reviewed twice in his presence in Tampa), sent an e-mail saying that he had been confused over the decision to use 90 and 99% as endpoints of an illustrative range for the effectiveness of the moratorium (i.e. that fishing mortality had been reduced by the moratorium only by a factor of ten, or by as much as a factor of a hundred, relative to its pre-moratorium value) and thought they were too optimistic.

These events have not made it easier to get the reports concluded and distributed in accordance with the contract deadlines.

Materials provided for the meeting, including their timeliness, relevance, content, and quality

Assessment and data documents were received in good order and early enough. Some guiding documents that would have been useful were not provided. Notable among those were a) brief histories of the assessments, i.e. how they came into being, when, why, and at whose request they were written, and what the prospects would be of having changes made to them; and b) templates for reports—it transpired that the Advisory Report has a fairly specific format that is preferred, and a template or example would have been useful to clarify for the Chairman before the meeting how the information to be derived from the assessments was to be presented in final reports and therefore, to some extent, to define the set of information to be sought.

A little more information on the meeting format would also have been helpful. The Chairman was not aware before the meeting that the public would be present, and when he was aware of it, he wasn't quite clearly informed what they were doing there and to what degree they were entitled to participate in the process. These questions got sorted out at the meeting, and in the end public participation was in high degree both orderly and helpful.

The guidance provided to run the meeting.

The guidance provided to run the meeting was adequate. The principal unclear area lay in the extent to which the function of the meeting was to review the assessments, and the extent to which it was to generate management advice. One of the management council staff members was continually jumping ahead to considerations of management advice when the rest of us thought we were still reviewing the assessments, which caused minor problems with the flow of discussion.

A second unclear area was the function and rights of the members of the public present at the meeting. This got sorted out satisfactorily, and the members of the public seemed at least as satisfied as others present with the conduct of the meeting and their own participation.

Converting the approved assessments into management advice is in fact an important part of the meeting function. It would probably be a good idea therefore if draft management advice were available on the same footing as the draft assessment, so that the Review Committee would review and approve it and check that it is substantiated by the assessment as reviewed and approved. Otherwise, the Chairman should be advised to put one of the Review Panel members specifically to collect material that will slot into the Advisory Report.

3. Other observations on the meeting process.

The meeting process and facilities were satisfactory; it would have been helpful to have foreseen the requirement for a printer, and to have arranged in advance to have not only a printer, but also a table to put it on, and a driver diskette as well. Facilities for presenters were minimal and unsatisfactory: they needed more space to put their papers. Rapid, coherent, explanations of these complicated assessment models helps to make them intelligible, and good facilities for presenters are important.

It is a mistake to try to compress such meetings into too few days. Long days put unacceptable pressure on the report-drafting which ideally takes place at the meeting. We had a fairly uncomplicated and trouble-free meeting, but even so did not have much time to spare.

The delayed response by some Panel members to reports has been a problem; when objections to decisions that were clearly nailed down at the meeting are first voiced two weeks later when the final report is about to be sent, an impossible situation arises in respect of completing and distributing the reports.

4. Appendices

Appendix I. Statement of Work

STATEMENT OF TASK

Consulting Agreement between the University of Miami and Dr. Michael Kingsley

January 16, 2004

General

South East Data, Assessment, and Review (SEDAR) is a process in the southeast for stock assessment and review. The program provides a framework for independent peer review of stock assessments undertaken jointly by NMFS-SEFSC, three Regional Fishery Management Councils, two Interstate Fishery Commissions, and state fishery agencies in the southeast. SEDAR uses a three-phase approach: a data workshop, an assessment workshop, and a peer review panel workshop. The peer review panel is composed of stock assessment experts, other scientists, and representatives of council, fishing industries, and non-governmental conservation organizations. Final SEDAR documents include a stock assessment report from the assessment workshop, a review panel report evaluating the assessment (drafted during the review panel workshop), a report that presents the peer-reviewed assessment results, and collected stock assessment documents considered in the SEDAR process.

Goliath grouper and hogfish stocks under assessment are within the jurisdiction of the South Atlantic and Gulf of Mexico Fishery Management Councils and respective southeastern states and fishery commissions. The review workshop for the goliath grouper and hogfish stock assessments will take place at the Tampa Airport Hilton in Tampa, FL from January 27, 2004 (beginning at 2:00 pm) through January 30, 2004 (ending at 3:00 pm).

SEDAR Assessment Review Panel Tasks:

The SEDAR Assessment Review Panel will evaluate the goliath grouper and hogfish assessments, input data, assessment methods, and model results as put forward in stock assessment reports. The Assessment Review Panel will:

Specifically, the review panel will:

1. Evaluate the adequacy and appropriateness of fishery-dependent and independent data used in the assessment (i.e. was the best available data used in the assessment).
2. Evaluate the adequacy, appropriateness and application of models used to assess these species and to estimate population benchmarks (MSY, Fmsy, Bmsy and MSST, i.e. Sustainable Fisheries Act items).
3. Evaluate the adequacy, appropriateness, and application of models used for rebuilding analyses.

4. Develop recommendations for future research for improving data collection and the assessment.
5. Prepare a report summarizing the peer review panel's evaluation of the goliath grouper and hogfish stock assessments. (Drafted during the Assessment Review Panel workshop with a final report due two weeks after the workshop ends)
6. Prepare a summary stock status report including management recommendations. (Drafted during the Assessment Review Panel workshop with a final report due two weeks after the workshop ends)

It is emphasized that the panel's primary duty is to review the existing assessment. In the course of this review, the Chair may request a reasonable number of sensitivity runs, additional details of the existing assessment, or similar items from technical staff. However, the review panel is not authorized to conduct an alternative assessment, or to request an alternative assessment from the technical staff present. To do so would invalidate the transparency of the SEDAR process. If the review panel finds that the assessment does not meet the standards outlined in points 1 through 3, above, the panel shall outline in its report the remedial measures that the panel proposes to rectify those shortcomings.

The Review Panel Report is a product of the overall Review Panel, and is NOT a CIE product. The CIE will not review or comment on the Panel's report, but shall be provided a courtesy copy, as described below under "Specific Tasks." The CIE product to be generated is the Chair's report, also discussed under Specific Tasks.

Specific Tasks

The CIE designee will serve as Chair of a SEDAR Stock Assessment Review Panel workshop for goliath grouper and hogfish, January 27-30, 2004. The workshop panel will review stock assessments for goliath grouper and hogfish in the jurisdiction of the South Atlantic and Gulf of Mexico Fishery Management Councils and applicable southeastern states and fisheries commissions.

It is estimated that the Chair's duties will occupy a total of 17 days - several days prior to the Review Panel meeting for document review; four days at the SEDAR meeting; several days following the meeting to ensure that the final documents are completed, and several days to complete a Chair's report for the CIE.

Roles and responsibilities:

1. Prior to the Assessment Review Panel workshop the Chair will be provided with the stock assessment reports and associated documents for goliath grouper and hogfish. The Chair shall read and review all documents to gain an in-depth understanding of the stock assessments under consideration and the data and information considered in the assessments.
2. During the Review Panel meeting, the Chair shall control and guide the meeting, including the coordination of presentations and discussions, and document flow.
3. The Chair shall facilitate the preparation and writing of the Peer Review Panel Report (Item 5 under "SEDAR Assessment Review Panel Tasks") and a Draft Summary Stock Status Report (Item under SEDAR Assessment Review Panel Tasks). Review panel members, SEFSC staff and

stock assessment scientists present at the meeting will assist the Chair as needed. The Chair shall be responsible for the editorial content of the two review panel reports, and the Chair shall be responsible for overseeing that both reports are produced and distributed to appropriate contacts on schedule (see “Final Reports” below).

4. The SEDAR Coordinator will assist the Chair prior to, during and after the meeting to ensure that final documents/results are distributed in a timely fashion.
5. No later than February 13, 2004, the Chair shall submit a written chair report¹ addressed to the “University of Miami Independent System for Peer Review,” and sent to Dr. David Sampson, via e-mail to David.Sampson@oregonstate.edu, and to Mr. Manoj Shivlani, via e-mail to mshivlani@rsmas.miami.edu. See Annex 1 for the contents of the Chair’s report.

Workshop Final Reports:

The Chair shall send final workshop reports to the University of Miami Independent System for Peer Review to Dr. David Die via email to ddie@rsmas.miami.edu. The Chair shall also send final workshop reports (in Word or WordPerfect format and in hardcopy) to:

Nancy Thompson, NMFS Southeast Fisheries Science Center, 75 Virginia Beach Drive, Miami, FL 33149 (email, Nancy.Thompson@NOAA.gov)

Larry Massey, 101 Nina Drive #302, Virginia Beach, VA 23462 (email, Larry.Massey@NOAA.gov)

John Carmichael, NOAA Beaufort Laboratory, 101 Pivers Island Road, Beaufort, NC 28516 (email, John.Carmichael@safmc.net)

Robert Mahood, South Atlantic Fishery Management Council, One Southpark Circle, Suite 306, Charleston, SC 29407 (email, Robert.Mahood@safmc.net)

Wayne Swingle, Gulf of Mexico Fishery Management Council, 3018 North U.S. Highway 301, Suite 1000, Tampa, FL 33619-2272 (email, Wayne.Swingle@noaa.gov).

¹ The written Chair report will undergo an internal CIE review before it is considered final. After completion, the CIE will create a PDF version of the Chair’s report that will be submitted to NMFS and the consultant.

Appendix II: Agenda

SEDAR 6 Goliath Grouper and Hogfish Review Workshop

January 27 – 30, 2004; Hilton Tampa Airport Westshore

Tuesday, January 27 2004.

2:00 – 5:30 1. Introduction SEDAR Coordinator
2. Review of Agenda SEDAR Coordinator
3. Goliath Grouper
3.1. Assessment Presentations Dr. Clay Porch

Wednesday, January 28, 2004.

8:30 – 12:00 3.2 Assessment Discussion Chair
12:00 – 1:30 Lunch
1:30 – 5:30 3.3 Draft Consensus Summary and Advisory Report Chair/SEDAR Leader

Thursday, January 29 2004.

8:30 – 12:00 4. Hogfish
4.1 Assessment Presentations Dr. Jerry Ault
12:00 – 1:30 Lunch
1:30 – 5:30 4.2 Assessment Discussion Chair

Friday, January 30, 2004.

8:30 – 12:00 4.3 Draft Consensus Summary and Advisory Report Chair/SEDAR Leader
12:00 – 1:30 Lunch
1:30 – 3:00 5. Final Review of Reports Chair

Appendix III: Attendees

This list may not be complete as regards the public presence. Not all those listed were present throughout the meeting.

Review Panel:

Ralph Allen (GMFMC Advisory Panel; Independent)
Luiz Barbieri (GMFMC Science and Statistics Panel; Florida Fish and Wildlife Conservation Commission)
Jon Brodziak (Reviewer; Northeast Fisheries Science Center, NMFS)
Marianne Cufone (Reviewer; The Ocean Conservancy)
Don DeMaria (SAFMC Advisory Panel; Independent)
Michael C.S. Kingsley (Chairman; Center for Independent Experts)
Debra Murie (GMFMC Finfish Assessment Panel; University of Florida)
Michael Murphy (GMFMC Finfish Assessment Panel; Florida Fish and Wildlife Conservation Commission)
Julie A. Neer (Reviewer; Southeast Fisheries Science Center, NMFS)
Jay Rooker (GMFMC Finfish Assessment Panel; Texas A&M University), Richard Taylor (GMFMC Reviewer; Independent)
Eddie Toomer (GMFMC Advisory Panel; Independent)
John Wheeler (Reviewer; Center for Independent Experts)

Fishery Management Councils

Steven Atran (GMFMC)
John Carmichael (SAFMC; SEDAR)
Stu Kennedy (GMFMC)

National Marine Fisheries Service

Michael Barnette
Jim Bohnsack
Alex Chester
Anne-Marie Eklund (co-presenter)
Stephen Holiman
Peter Hood
Jennnifer Jacukiewicz
John McGovern
Clay Porch (presenter)
Jerry Scott
Phil Steele
Steve Turner

Florida Fish and Wildlife Conservation Commission

Jim Colvocoresses
Rich McBride
Andy Strelchek
Roy Williams

Universities

Jerald Ault (presenter)
Steven Smith (presenter)

Public

Chad Carney
Jason de la Cruz
Jim Gillespie
Sean Gucken
Chris Hill
Charles Hogge
Scott Hooker
Armando Juarez
James Kejonen
Garner Koons
Dennis O'Hern
Durryl Ogden
Jane Toomer
Ed Walker
Scott Weber
Jim Zurbrick

Appendix IV: Bibliography of the materials provided for the meeting

Assessment and data documents

Anon. n.d. [2003.] Goliath grouper data workshop report. SEDAR3-DW-1. 11 pp.

Anonymous. n.d. SEDAR Hogfish Assessment, SEDAR6-RW-5, 3 p.

Ault, J.S., S.G. Smith, G.A. Diaz and E. Franklin. 2003. Florida Hogfish Fishery Stock Assessment. Rep. prep. by Rosenstiel School of Marine and Atmospheric Science, University of Miami, for Florida Marine Research Institute, Florida Fish & Wildlife Conservation Commission, St Petersburg, Fla. 89 pp.

Cass-Calay, S.L., and T.W. Schmidt. 2003. Standardized catch rates of juvenile goliath grouper, *Epinephelus itajara*, from the Everglades National Park Creel Survey, 1973-1999. SEDAR6-RW-2. Contribution SFD-2003-0016, Sustainable Fisheries Div. SE Fisheries Science Center, National Marine Fisheries Service, Miami, Fla. 17 pp.

Porch, C.E., A.-M. Eklund and G.P. Scott. 2003. An assessment of rebuilding times for Goliath grouper. SEDAR6-RW-3. Contribution No. SFD-2003-0018, Sustainable Fisheries Div., SE Fisheries Science Center, National Marine Fisheries Service, Miami, Fla. 25 pp.

Porch, C.E., and A.-M. Eklund. 2003. Standardized visual counts of Goliath grouper off south Florida and their possible use as indices of abundance. Contribution SFD-0017, Sustainable Fisheries Division, SE Fisheries Science Center, NMFS, Miami, Fla. 23 pp

Additional references, 'for information' papers and other relevant material, not all available at the meeting.

Ault, J.S., J.A. Bohnsack and G.A. Meester. 1998. A retrospective (1979–1996) multispecies assessment of coral reef fish stocks in the Florida Keys. *Fish. Bull.* 96(3): 395–414.

Ault, J.S., S.G. Smith, G.A. Meester, J. Luo and J.A. Bohnsack. 2001. Site characterization for Biscayne National Park: assessment of fisheries resources and habitats. NOAA Technical Memorandum NMFS-SEFSC-468. 165 pp.

Ault, J.S., S.G. Smith, G.A. Meester, J. Luo, J.A. Bohnsack and S.L. Miller. 2002. Baseline multispecies coral reef fish stock assessment for the Dry Tortugas. NOAA Technical Memorandum NMFS-SEFSC-487. 127 pp.


Bullock, L.H., M.D. Murphy, M.F. Godcharles and M.E. Mitchell. 1992. Age, growth and reproduction of jewfish *Epinephelus itajara* in the eastern Gulf of Mexico. *Fish. Bull.* 90: 243–249.

Claro, R., K.C. Lindemann and L.R. Parenti. 2001. Ecology of the Marine Fishes of Cuba. Smithsonian Institution Press, Washington D.C. 253 pp.

Legault, C.M. and Eklund, A.-M. 1998. Generation times for Nassau grouper and jewfish with comments on M/K ratios. Contribution SFD-97/98-10A, Sustainable Fisheries Division, Southeast Fisheries Science Center, National Marine Fisheries Service, Miami, Fla.

- McBride, R. 2001. Age, growth and reproduction of hogfish, *Lachnolaimus maximus*. FMRI Final Report FO723-98-00-F.
- McBride, R.S. and M.D. Murphy. 2003. Current and potential yield per recruit of hogfish, *Lachnolaimus maximus*, in Florida. Proc. Gulf and Caribbean Fisheries Institute 54: 513–525.
- Myers, R.A., and G. Mertz. 1998. Reducing uncertainty in the biological basis of fisheries management by meta-analysis of data from many populations: a synthesis. Fish. Res. 37: 51–60.
- Prager, M.H. 1994. A suite of extensions to a non-equilibrium surplus-production model. Fishery Bulletin 92: 374–389.
- Rose, K.A., J.H. Cowan, K.O. Winemiller, R.A. Myers and R. Hilborn. 2001. Compensatory density dependence in fish populations: importance, controversy, understanding and prognosis. Fish and Fisheries 2: 293–327.
- SEDAR Peer Review of Yellowtail Snapper Assessment, with comments on Goliath Grouper (Tampa, Florida, 28–31 July, 2003).

Appendix V: Summary reports

1. The Goliath Grouper in Southern Florida: Assessment Review and Advisory Report 
2. The Hogfish in Florida: Assessment Review and Advisory Report 