

**Advisory Assessment Report  
SEDAR 9  
Greater Amberjack**

**4.1. Stock Distribution and Identification**

Genetic studies indicate that the stock within the Gulf of Mexico constitutes a single biological stock. The geographic boundary of the management units occurs from the Dry Tortugas through the Florida Keys. Treating this region as a single biological stock is appropriate.

**4.2. Assessment methods**

The preferred assessment method chosen is a simple production model of the Schaefer type (uses a symmetric production curve) which assumes all individuals are equivalent and selectivity is ignored. Alternative and previous assessments (a VPA and an age-structured surplus production model) show similar assessment outcomes but a lack of good quality ageing data adds an unknown amount of uncertainty to these methods and they are not adequate at present.

**4.3 Assessment data**

The data sources and assumptions used were:

- MRFSS estimates of catch and standardized catch rates.
- Head boat estimates of catches and standardized catch rates.
- Commercial hand line catches and standardized catch rates.
- Commercial long line catches and standardized catch rates.

- Date was available and modelled from 1986 to 2004.
- Release mortality was assumed to be 20%.
- Bycatch in the prawn fishery is assumed to be negligible.

**4.4 Catch trends**

Total catches are modelled from 1986.

Early catches were relatively variable which may be simply a reflection of early variation in the MRFSS catch estimates.

The general trend in catches across all sectors was a decline to 1998 followed by an increase to 2003 with a small drop in 2004.

**4.5 Fishing mortality trends**

Fishing mortality, as expressed as  $F_{\text{current}}/F_{\text{MSY}}$ , was variable and above 1.0 until about 1998 after which there is a reduction closer to a ratio of 1.0 but remaining above this threshold. Full details will only become available in the addendum to the assessment report deriving from the new analysis.

## 4.6 Stock abundance and biomass trends

Stock biomass followed a pattern similar to total catches except it was less variable. There was a decline from 1986 down to 1998 until the ratio  $B_{\text{current}}/B_{\text{MSY}}$  was below of 1.0. This decline was followed by a slow increase to the present. Full details will only become available in the addendum to the assessment report deriving from the new analysis.

## 4.7 Status determination criteria

The stock appears to be in both an overfished condition and was being overfished in 2004. This was determined by a consideration of the ratios of the current biomass estimate  $B_{2004}$  with  $B_{\text{MSY}}$  and the current fishing mortality  $F_{2004}$  with  $F_{\text{MSY}}$ ; biomass is less than half the limit reference point of  $B_{\text{MSY}}$ , and fishing mortality was 50% greater than its limit reference point of  $F_{\text{MSY}}$ . However, these results are very dependent upon the weighting applied to the different time series of catch rates, the base case is to weight each series of catch rate indices in line with the total proportion catch by each sector over the past eight years. When each catch rate is weighted equally (the poorest assumption) the stock remains overfished but less so than the base case, and is only just in the overfishing state.

Much of the uncertainty in the stock status derives from the indices of relative abundance being inconsistent between sectors in 2004. This makes the projections both uncertain and uninformative so that it is recommended that an update assessment be conducted in the next few years to determine the stock trajectory with more precision.

## 4.8 Stock Status

The parameters relevant to management are estimated as follows:

<i>Parameter</i>	<i>Value</i>
<b>Population parameters and management benchmarks</b>	
MSY (million pounds)	5.039
$B_{\text{MSY}}$	8.873
$F_{\text{MSY}}$	0.568
<b>Stocks parameters in 2004</b>	
$F_{2004}$	0.863
$F_{2004}/F_{\text{MSY}}$	1.520
$B_{2004}$	4.250
$B_{2004}/B_{\text{MSY}}$	0.479

Declarations of Stock Status:

- the stock was overfished in 2004 ( $B_{2004}/B_{\text{MSY}} < 1.0$ );
- the stock was undergoing overfishing in 2004 ( $F_{2004}/F_{\text{MSY}} > 1.0$ );
- the stock was overexploited with respect to the optimum fishing mortality;

- uncertainty has been added to the assessment by the 2004 data. Catch rate data from the four different sectors exhibits significant differences in 2004 and the assessment outcome and projections are very dependent upon how the catch rate series are weighted;

#### **4.7 Projections**

Only draft projection have been presented (SEDAR9 Review Workshop). Full quantitative projections will be available as an Addendum to the greater amberjack assessment document. The draft projections are uncertain depending upon the last year of catch rate data and how the catch rate series are weighted when fitting the model. This uncertainty is so great that the future stock status cannot be forecast adequately. *Because of this uncertainty it is recommended that an update assessment be conducted in the next few years to determine the most likely stock status trajectory and respond appropriately at that time.*

#### **4.8 Allowable biological catch**

Adequate projections are not available and will remain in that state until an update assessment is conducted. In the meantime, it would be precautionary to not recommend that the catch should remain as it is and should not be increased.

#### **4.9 Special Comments**

The change of assessment model from the VPA base case used previously to the simpler simple stock production curve was the most appropriate move given the uncertainty in ageing greater amberjack combined with the small samples used to characterize the catch-at-age. However, the stock status remains unchanged with the introduction of the simpler model. It was concluded that the stock was both overfished in 2004 and was experiencing overfishing in 2004. It is stressed, however that:

(1) the catch rate data in 2004 was inconsistent between sectors; the minor components of the fishery (recreational headboats and commercial longline) exhibited an increase while the major components of the fishery (recreational charter boat and private boats with commercial hand line vessels) exhibited different degrees of decrease. This is why different weightings produced different outcomes.

(2) there may be other reasons why the different sectors exhibited different trends in 2004, these include a) different selectivities between sectors, b) different fishing locations of each sector with some being more representative than others, and even c) a very strong recruitment into the fishery combined with the selectivity by the charter boats for smaller fish.

(3) the assessments were well developed but the assessment staff had clearly not had sufficient time to fully explore all options. It is recognized that scientific advice is required for many species but additional scientific and technical resources need to be made available or else current stock assessment staff will be hard pressed to maintain the high quality of their work.

#### 4.10 Sources of information

The report from the Data Workshop for greater amberjack along with the associated workshop documents.

The report from the Assessment workshop for greater amberjack along with associated documents.

The SEDAR9 Review workshop discussions and presentations.