

## Weakfish Technical Committee Report

April 15, 2005

The Technical Committee met in Raleigh, NC, on April 13 and 14, 2005. Below is a summary of that meeting.

### **Attendees**

#### *Technical Committee / Stock Assessment Subcommittee Members*

Jim Uphoff (MD), Chair	Rob O'Reilly (VA)
Des Kahn (DE), Vice Chair	Michael Murphy (FL)
Lee Paramore (NC)	Greg Skomal (MA)
Doug Vaughan (NMFS)	Christina Grahn (NY)
Vic Crecco (CT)	Jeff Brust (NJ)

#### *ASMFC Staff*

Patrick Kilduff  
Brad Spear

### **Stock Assessment Conclusions and Recommendations**

All SAS and Technical Committee (TC) members agreed during a conference call on February 1, 2005, that (1) there has been a decline in weakfish abundance during the past few years, (2) little evidence supported overfishing as a cause, and (3) strong circumstantial evidence existed that natural mortality had risen. However, several members were unavailable for the call. After discussion of the stock assessment at its last meeting on February 9, 2005, the Weakfish Management Board agreed that the full Technical Committee and Stock Assessment Subcommittee should conduct a thorough review of the assessment, focusing on the role of F in the stock decline. The Board also directed the TC to answer four questions regarding stock status and management (answered below).

#### **What is the cause of decline in weakfish abundance?**

Estimates of mortality are instantaneous annual rates in this summary and are biomass based for ages 1-5 unless otherwise noted.

Total mortality ( $Z$ ) of weakfish has risen substantially since 1995, primarily driven by an increase in natural mortality,  $M$  (all sources of mortality such as predation, competition, and pollution other than fishing mortality,  $F$ ).  $F$  was highest during 1989-1990 ( $F = 0.8-1.1$ ) and accounted for nearly all estimated mortality. Estimated  $F$  steadily decreased to about 25% of all mortality by 1999-2000. Estimates of  $Z$  from ADAPT VPA rose from about 0.5 to 1.1 during 1995-2000; retrospective bias was unacceptably high after 2000 and more current estimates of  $Z$  from ADAPT VPA could not be used. Year-class catch curves (number-based) from two independent sources (catch-at-age matrix and DE trawl survey) supported the trend of rising  $Z$  over the same time span indicated by VPA. Reliable estimates of  $F$  existed through 2003, but unbiased estimates of  $Z$  did not. Estimates of  $F$  were low during 1994-1999 (0.22-0.27) and then

rose to a modest level (0.39) during 2000-2003. A continued rise in M during 2000-2003 was inferred from sharply declining biomass (29,000 to 7,000 mt).

The Technical Committee is looking seriously at trophic interactions among weakfish and several candidate finfishes (striped bass, Atlantic menhaden, spot, bay anchovy, Atlantic croaker, and summer flounder) as a working hypothesis to explain the recent stock decline and several analyses have been supportive. A striped bass–weakfish predator-prey model supported the hypothesis that Z continued to rise in recent years due to a steep rise in M. Other environmental factors (climate, pollution, etc) potentially offer an explanation for the decline as well, but analyses have not been conducted.

### **What can be done to stop or reverse the decline? What are the implications of action?**

Reducing F should work as long as the factors associated with increasing M (food-web, climate, or environmental influences) do not offset reductions in F. The effectiveness of restoring the population by managing the weakfish fishery alone may be muted because of the increasingly large role of M in recent population dynamics. A significant reduction in F could accelerate a long-term recovery if M falls, but the prospects for short-term (less than five years) recovery appear dim. If M mostly is occurring on sub-legal weakfish, reducing F on legal fish may not help. Reductions in M might, in theory, be possible by manipulating forage fish fisheries to increase prey and by reducing predator populations.

### **What are the implications of no action?**

The Technical Committee cannot predict the effect of not taking action. No action would be consistent with management prior to the 1990s.

Weakfish biomass (ages 1+) fell to 20% of an unfished stock in 2003; this approximates the SSB trigger in Amendment 4. Biomass should be a reasonable proxy for SSB because nearly all weakfish mature at age 1. If a biomass proxy is acceptable, falling below this trigger under Amendment 4 requires a weakfish management program to rebuild biomass to 30% of an unfished stock in six years or less. Under this proxy measure of SSB, no action would violate Amendment 4. It will be difficult to design a rebuilding program without accurately accounting for trends in M.

F-based reference points in Amendment 4 have little utility in this situation because of rapidly increasing M, the ages the reference points apply to, and the currency they are derived from. In the current assessment, F estimates are derived from biomass of ages 1-5, while the F reference points in Amendment 4 are number-based for ages 4-5. Rapid changes in M casts doubt on the equilibrium assumptions that traditional reference points rely on.

### **What is the TC's recommendation for action?**

There was a consensus recommendation to reduce F by half. Arguments were advanced supporting everything from no action (F is a small part of the problem and a reduction is unfair to fishers) to a full moratorium (the most action directed at the weakfish fishery that could be taken). Planning for reductions in F could rely on the current reduction in F formula in Amendment 4 using the 1990-1992 reference period, but a more recent reference period would be far more relevant to the current situation. Options discussed by the TC included peak

spawning closures, a bycatch only fishery, a total allowable catch, lower creel limits and higher size limits, and closures synchronized with migration.

### **Biological Sampling Requirement**

The TC discussed the problems associated with the sampling requirements in Amendment 4. However, it was not practical for the entire group to attempt to revise the requirements. A small working group (Doug Vaughan, Des Kahn, Patrick Kilduff, and Brad Spear) was formed to draft new requirements. Draft Addendum I of Amendment 4 has been circulated among the TC members. Several members are still reviewing it. Stock Assessment Subcommittee Chair, Des Kahn, drafted a memo (attached) to Board members giving general guidance on what biological data needs to be collected for the stock assessment. The memo is intended to give states direction for their sampling program while draft Addendum I is being completed. The draft addendum will be provided to the Board at the May meeting.

There were several issues that the Board discussed at its last meeting that were not addressed by the TC or through the draft Addendum. How to define 'out of compliance' and what states can do to come back into compliance remain unresolved. The TC felt that the Weakfish Board or possibly the Policy Board would be more appropriate to resolve these issues.

Even though sampling was a compliance requirement in Amendment 4, some states did not sample the appropriate amount. Problems with funding and personnel were cited as reasons for not meeting the requirement. Furthermore, TC representatives from New York and New Jersey noted that even if funding and personnel became available, logistics of sampling and unwillingness of the industry to cooperate may prevent their states from meeting the requirement. These issues must be taken up by the Board and individual states at the May meeting.