

Review of the Status and Health of the Shrimp Stocks for 2007

by

James M. Nance, Ph.D.
NMFS - Galveston Laboratory

Farfantepenaeus aztecus (brown shrimp), Farfantepenaeus duorarum (pink shrimp), and Litopenaeus setiferus (white shrimp), comprising the bulk of the Gulf of Mexico shrimp fisheries, are essentially annual crops. Annual harvests vary considerably due to fluctuations in environmental conditions experienced by larvae and juveniles. Maximum sustainable yield (MSY) estimates have been reported, based on analytical models of catch and effort. Such MSY values are were near observed maximum catches. However, due to the environmental fluctuations seen to date, catches above MSY, even if persisting over several years, must not of themselves be taken as evidence of overfishing.

The findings by Nance et al. (1989), Klima et al. (1990), and Nance (1993), agree that the best way to define overfishing for the three major shrimp species in the Gulf of Mexico is in terms of spawning population size. Empirical comparisons of over 40 years of landings data with the indices of spawning population size determined by VPA stock assessment were used by Nance et al. (1989), Klima et al. (1990), and Nance (1993) to define minimum levels of spawning stock believed to be compatible with maximum productivity under current environmental conditions. These values are the most meaningful proxy for MSY. Maintaining parent stock numbers above these levels should be sufficient to prevent overfishing on each of the shrimp stocks.

Parent stock is defined for brown shrimp as the number of age 7+ (months) shrimp during the November through February period, with a level of 125 million shrimp set as the lower limit. White shrimp parent stock is defined as the number of age 7+ (months) shrimp during the May through August period, with a level of 330 million shrimp set as the lower limit. Pink shrimp parent stock is defined as the number of 5+ (months) shrimp during

the July through June period, with a level of 100 million shrimp set as the lower limit.

The parent number for two of the three major penaeid shrimp species was above the overfishing index level during 2007 (Figures 1-3). Brown and white shrimp parent levels were well above the overfishing index, while pink shrimp parent stock estimates were below the index level. Pink shrimp levels have fluctuated near the line for many years, but this is the first year it has dipped below the limit. CPUE remains above average for this stock and the great reduction in directed effort and associated catch might be a contributing factor to this decrease in the parent stock index value.

Besides the three major penaeid shrimp species, royal red shrimp (Hymenopenaeus robustus) is the only other commercial shrimp species in the Gulf of Mexico Shrimp Fishery Management Plan (FMP). Overfishing was defined for this species as fishing greater than optimal yield (OY) as defined in the FMP. OY was set at MSY (maximum sustainable yield), which was estimated to be 392,000 pounds of tails over 1,290 days fished. During 2007, a total of 229,024 pounds of royal red shrimp (tail weight) were caught in the Gulf of Mexico. This amount is under the overfishing index level set for this shrimp species (Figure 4).

Literature Cited

Klima, E., J. Nance, E. Martinez, and T. Leary. 1990. Workshop on the definition of shrimp recruitment overfishing. NOAA Technical Memorandum, NMFS-SEFC-264, 18 p.

Nance, J. 1993. Gulf of Mexico shrimp fishery recruitment overfishing definition workshop 2. NOAA Technical Memorandum, NMFS-SEFSC-323, 12 p.

Nance, J., E. Klima, and T. Czaplá. 1989. Gulf of Mexico Shrimp Stock Assessment Workshop. NOAA Technical Memorandum, NMFS-SEFC-239, 43 p.

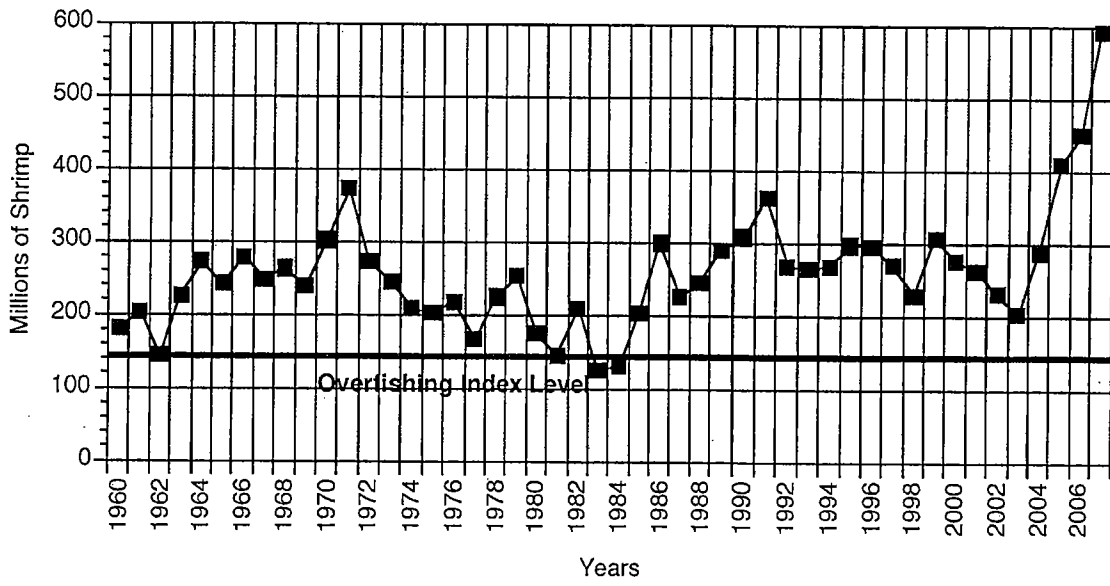


Figure 1. Brown shrimp parent stock levels over the past 48 years.

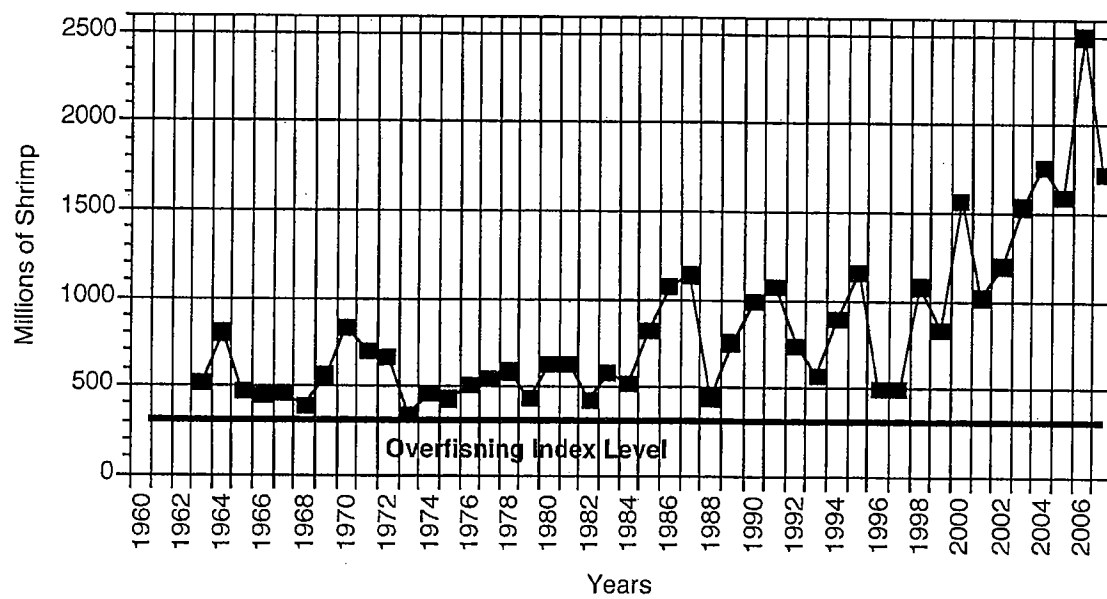


Figure 2. White shrimp parent stock levels over the past 45 years.

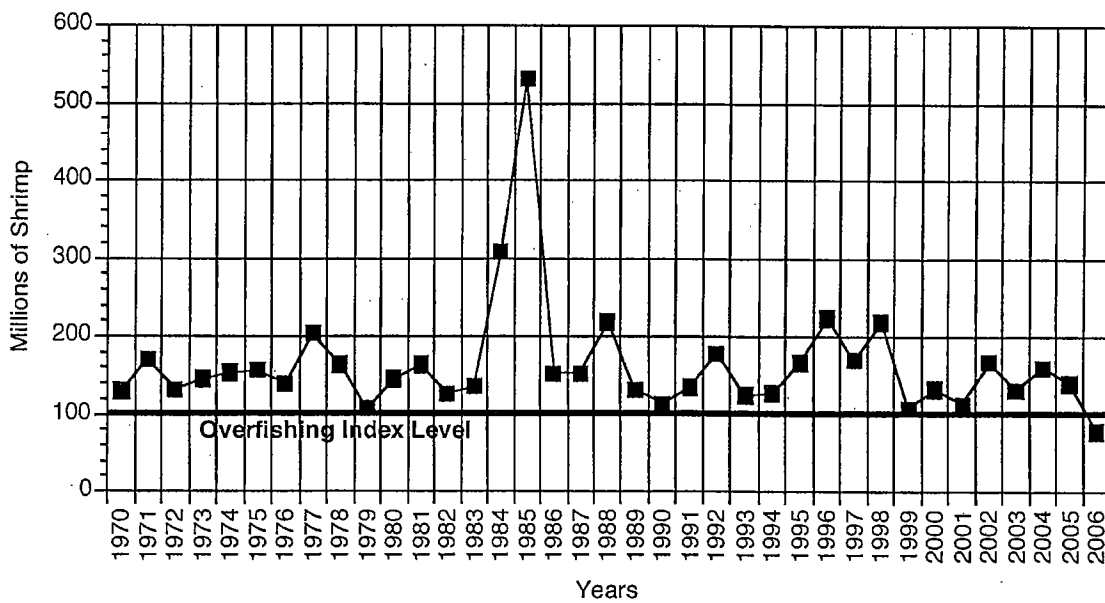


Figure 3. Pink shrimp parent stock levels over the past 37 years.

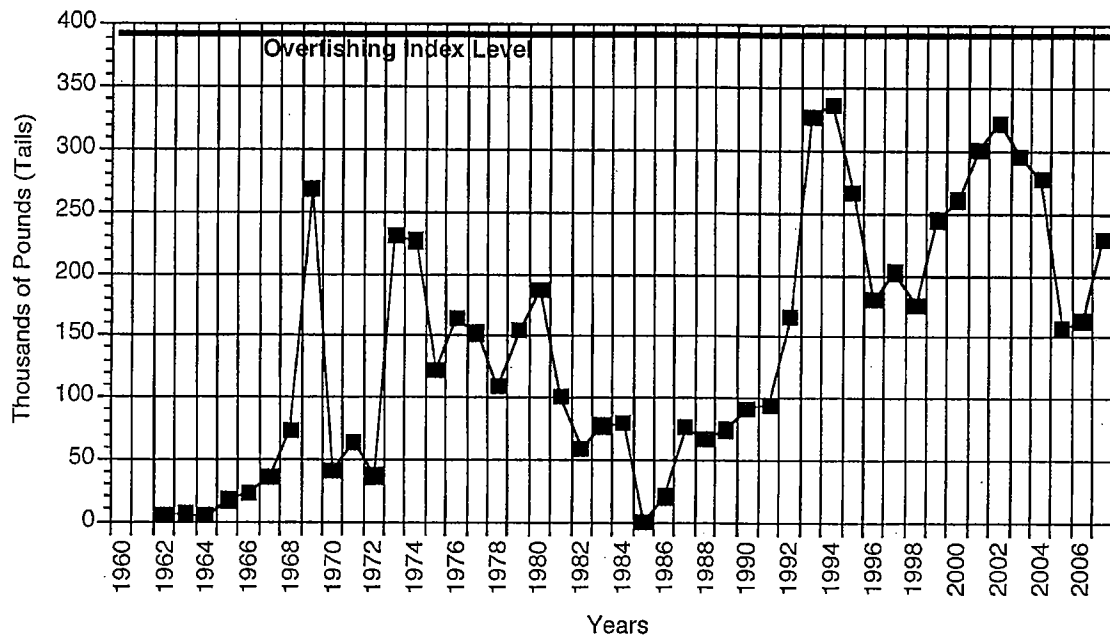


Figure 4. Royal red shrimp landing levels over the past 46 years.