

### 3.14 White Hake

#### Catch and Survey Indices

Commercial landings of white hake increased from less than 2,000 mt during the late 1960s to over 10,000 mt during the early-to-mid 1980s (Figure 3.14.1). Landings remained relatively high through the early 1990s, fluctuating between 6,000 and 10,000 mt until 1993. Landings subsequently declined, reaching 2,200 mt in 1997, and have remained between 2,000 and 3,000 mt since then (Figure 3.14.1).

NEFSC spring and autumn bottom trawl survey biomass indices for white hake increased from relatively low levels during the 1960s and fluctuated without trend for several decades thereafter (Figure 3.14.1). Both indices declined sharply during the 1990s and currently remain extremely low.

#### Stock Assessment

The most recent assessment of white hake was based on a biomass dynamics model (ASPIC) of catch and survey indices of >60cm fish, and the results were reviewed by the 33<sup>rd</sup> Northeast Regional Stock Assessment Workshop (33<sup>rd</sup> SAW) in June 2001 (NEFSC 2001c). These results confirmed the trends derived from the previous analyses and indicated further declines in stock biomass and increases in fishing mortality between 1998 and 2000. The biomass estimates from the model indicate that biomass increased to levels above  $B_{msy}$  in the late 1960s through the early 1980s. Biomass has since declined and is estimated to be about 20% of  $B_{msy}$ . The estimates of fishing mortality show an increasing trend from a low in 1967. The current estimate of fishing mortality is at least twice the  $F_{msy}$  estimate.

#### Surplus Production Analysis

A surplus production model incorporating covariates (ASPIC, Prager, 1995) was conducted on the biomass of white hake greater than 60 cm (NEFSC 2001c). The reference points from this analysis were considered to be provisionally acceptable, because of a concern about an increase survey catchability after 1972.  $B_{msy}$  was estimated to be 14,700 mt,  $F_{msy}$  was estimated to be 0.29, and MSY was estimated to be 4,200 mt (Figure 3.14.2).

#### Projections

Observed catch from January to November 2001 was 3,150mt, which corresponds to a total annual catch of 3,360mt based on proportion of 2000 landings taken in December, by gear. Assuming 200 mt of Canadian catch, and 75% of U.S. catch >60cm, the preliminary estimate of 2001 catch >60cm is 2,670mt. With an estimate of 2001 stock biomass of 3,000mt from the biomass dynamics model, the estimate of 2001 catch would severely deplete the stock, especially if the large resulting  $F$  were assumed to continue in 2002. Projections were not considered to be reliable from the biomass dynamics model, because age-aggregated models do not perform well for describing the dynamics of severely depleted, age-structured populations. However, the working group concludes that if such high levels of catches were taken in 2001 and the intense exploitation rate continues in 2002, the stock will be in a severely depleted state, well below the most recent stock status of 20% $B_{MSY}$ .



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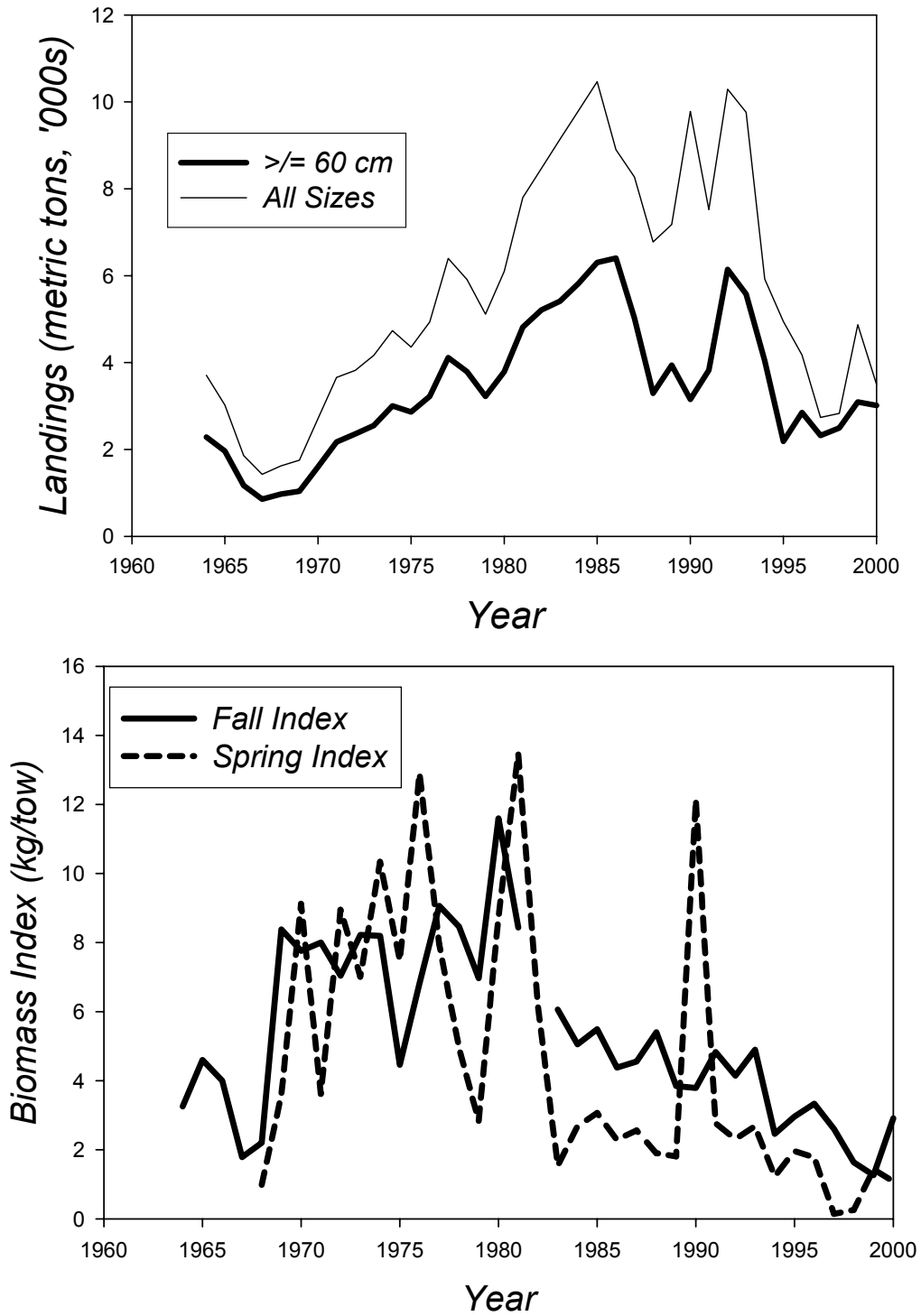


Figure 3.14.1. Landings and research vessel survey abundance indices for White hake.

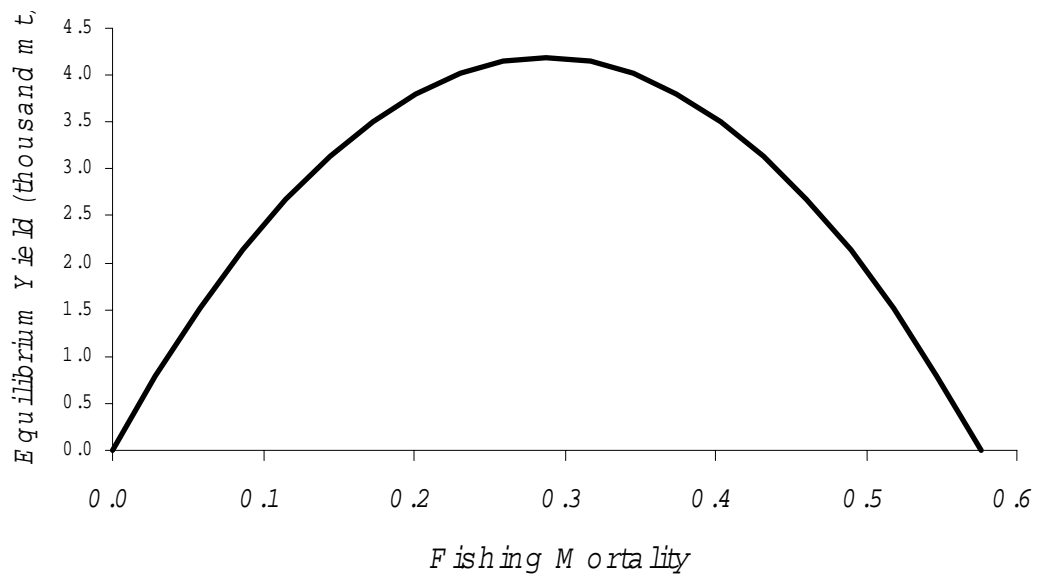
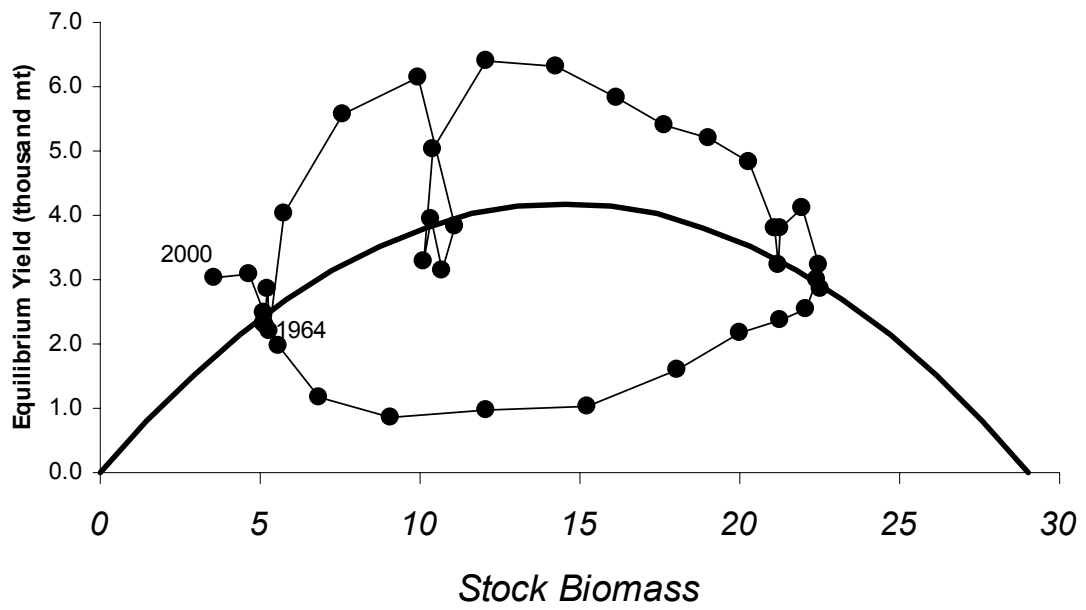


Figure 3.14.2. Results of surplus production analyses (ASPIC) for white hake