

## Overview of Indicators of SBT stock status

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### Summary

The panel has examined the indicators and conclude that there is no need for another assessment this year and that the August/September meeting should be devoted to management procedures. On balance, the qualitative indicators suggest that the stock of SBT appears to be increasing but there is again concern about the lack of reliable indicators of recruitment. Our conclusions are cautiously optimistic because in general, catch rates are about the same as in the mid 1990s.

In the sections below we discuss the individual indicators.

### Longline fishery CPUE

Overall, the total Japanese LL CPUE has increased from a low of 2.16 in 1998 to the 2002 level of 3.05. This increase is tempered somewhat since it is similar to the 1995 value of 2.95 and still is only about 61% of the 1980 level. The Japanese LL CPUE appears to show some positive signs, particularly for the ages 4-11. From an historical perspective, the ages 4-7 are estimated (from nominal CPUE data) to be at 91% of the 1980 level. While the older age groups are still quite low (below 50%) compared to the 1980 CPUE levels, they have increased by 13% from the 1995 level and 24% from the 2000 estimate.

The nominal CPUE for age 12+ shows less of an increase and is still well below the 1995 level (0.43 in 1995 compared to 0.30 in 2002).

The NZ CPUE data suggested an increase in one component of the fleet and a slight decrease in another. Overall, the CPUE appears to be relatively stable since 1997 and somewhat higher than the period 1989-1993.

### Japanese LL CPUE by cohort

CPUE by cohorts (averaged by 5-yr blocks) show lower rates of decline (lower total mortality?) for cohorts born in the 1990s than for earlier cohorts.

### Total catch, effort and estimated age composition in Australian surface fishery

The catch of age 1 and 2 year old SBT in the Aus. surface fishery was down substantially in 2002 compared with 2000 and 2001 data. The degree to which this is due to market considerations and the apparent preliminary nature of the 2002 data make interpretation of this indicator difficult. This *may* be a sign of poor recruitment level or alternatively, that 2000 and 2001 showed signs of good recruitment and that for 2002 is more like an average level. The total hours searched and the number of purse seine operations are up in the most recent season with

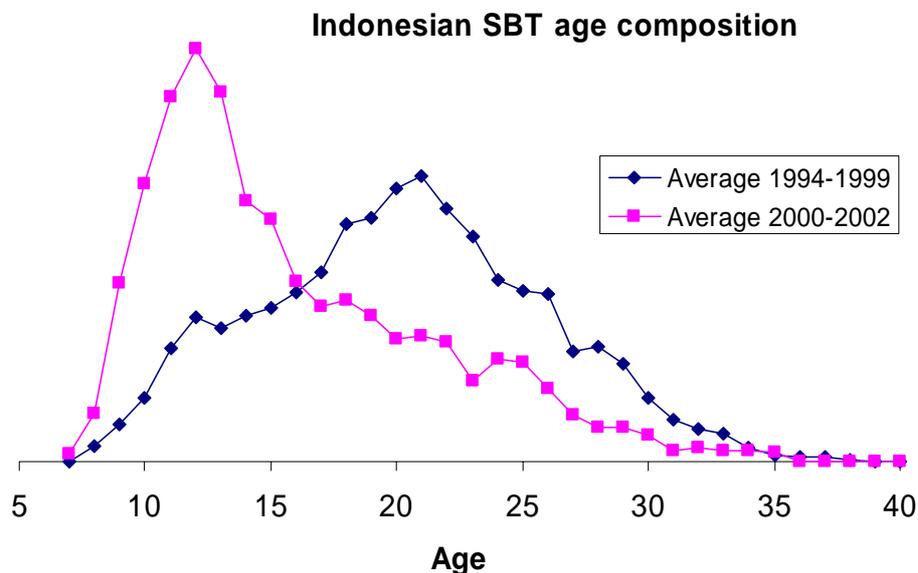
roughly the same level of catch. This suggests that the apparent abundance may be lower. Again the effect of market considerations and weather and oceanic patterns seem likely to influence this interpretation. Hence, this suggestion (lower abundance) may be particularly uncertain without closer examination.

### Total Indonesian catch by month and percentages of LL catch that is SBT

The total SBT catch in Indonesia for 2002 is similar to all other years as is the relative proportion of SBT compared to other tunas and billfish. There is no indication of concern from these data.

### Indonesian LL SBT age composition

As with last year's qualitative analysis, these data continue to show a higher proportion of younger fish. The average over the last two seasons (2000/2001 & 2001/2002) compared with the seasons since 1994 are striking:



This could either be interpreted as a pulse of recruitment of younger fish making it into the breeding population (the optimistic view), or a decline in total spawning population, particularly of the older individuals (the pessimistic view). The average age of 16+ fish has changed little. Given the upward short-term trend in 12+ CPUE, and the upward trend in the age 8-11 data in the Japanese longline fishery, and the general slow dynamic of the spawning population we were more inclined towards the optimistic view. Continuing to monitor this development will be important and may shed light on the spawning dynamics of this stock.

### Acoustic estimates of age 1 off W. Australia

The estimate of zero is a concern. Presumably this is related to the reduction in acoustic survey effort. However, a reduction by only about 33% of the survey effort seems unexpected to result in such a pessimistic indicator of age 1 abundance. The problems in tagging fish in 2002 were also noted and it is our understanding that the 2003 tagging season was more successful.

Nevertheless we remain concerned that the only indicators of recruitment are highly variable and negative at present.

### **Aerial spotting data**

The 2003 data appeared to be much more variable by month than aerial spotting data from 2002. The SAPUE data is equivocal in comparing two years of data. However, the similarity in magnitude of the two years is encouraging.

### **Tag returns**

The tagging data need to be subjected to a formal analysis to produce any useful information. John Pope did a quick analysis and his “report” is attached. The data seem to contradict the acoustic index data, but are not overly encouraging. However we recognize the limitations of the tagging data available in the late 1990’s and hope that the new tagging effort will provide substantially better data.