

Sablefish

i. Research programs

The annual longline trap survey was conducted under charter in the fall of 2001 aboard the chartered fishing vessel Ocean Pearl. Standardized sets were conducted at nine localities spatially dispersed along the B.C. offshore coast to provide a catch rate index. The localities were selected because they were fished by commercial vessels and are located about 60 nm apart such that normal weather conditions would permit all localities to be occupied within a 30 day period. The survey was depth stratified in the sense that sets in each locality were targeted within five depth ranges, but there is little replication of sets within each stratum. Additional sets were conducted within the survey localities to capture sablefish for tag application and release at the point of capture. A second component of the survey was conducted in the inshore waters of Hecate Strait and associated inlets to tag juvenile sablefish. In the course of 134 survey sets a total of 18,248 fish were tagged for release, 908 tagged fish were recovered, and 3983 fish were sampled for biological data (2670 otolith pairs). Another survey is planned for the fall of 2002.

ii. Stock assessment

Stock assessment and management of sablefish (*Anoplopoma fimbria*) in British Columbia is conducted cooperatively by the Canadian Sablefish Association (CSA) and Fisheries and Oceans Canada (FOC). The cooperative relationship is formalized under the auspices of a Joint Project Agreement (JPA) to:

1. Ensure the proper management of the commercial sablefish fishery;
2. Conduct necessary scientific research to assess the health and sustainability of the sablefish resource and assess ecosystem impacts;
3. Provide adequate funding and resources; and,
4. Carry out all other activities necessary in support of the fishery including.

Two assessments of sablefish were conducted during the 2001/2002 fiscal year. The November 2001 assessment of sablefish (Haist et al. 2001) relied primarily on the examination of abundance and exploitation rates computed from tag returns in the year following release. Trends in survey catch rates and, to a lesser extent, commercial trap fishery catch rates were used to corroborate the tag-recovery analysis. Based on the time series of exploitation rate estimates, the vulnerable biomass of sablefish in British Columbia (B.C.) was considered to be low and stable from 1996 to 2000 at about 35,000 metric tonnes. A total allowable catch (TAC) of 4,000 t coastwide was recommended for the 2002/2003 fishing year (Haist et al. 2001, Stocker and Cass 2001), the same harvest recommended for the previous fishing year (Haist et al. 2001, their Table 2).

Preliminary results from the 2001 sablefish survey became available subsequent to the preparation and review of the November 2001 assessment. Catch rates observed during the 2001 survey declined significantly compared to those observed in the previous five years (Figure 1). The mean number of sablefish caught per trap declined to about 0.6 of the 1996 to 2000 mean

catch rate for the southern stock. The observed decline was greater for the northern stock, with 2001 catch rates at about 0.2 of the 1996 to 2000 mean catch rate. In view of the preliminary results, fishery managers requested that the survey data and sablefish stock status be reviewed, and the tagging analysis updated in January 2002. A second assessment (Kronlund et al. 2002) was prepared as a supplemental to the November assessment to accommodate the new survey information and to help evaluate whether the current assessment of sablefish stock status should be revised.

Survey catch rates showed declines from 1990 to 2001 in seven of nine localities and generally showed declines at all depth strata surveyed. The decline was steepest in the first half of the time series, and slowed from 1996 to 2000. Catch rates in 2001 were the lowest in the time series, and generally exhibited much smaller variance in comparison to previous years. Commercial catch rates calculated from logbook records showed trends similar to the survey data within the survey localities. Trends were less well defined outside of the survey areas, but suggested a decline from 1990 to 2001 and reduction in variance in the latter few years of the series. Interpretation of these trends is complicated by the adoption of escape rings in trap gear in 1998. Estimates from the tagging program for 2001 indicated a biomass of 37,300 t with an exploitation rate of 0.096. The estimates of abundance were without trend from 1995 to 2001, with no significant outliers evident within this period. The tagging program estimates showed no evidence of a dramatic decline in abundance from 2000 to 2001.

In order to accommodate concerns that the stock may be experiencing continued decline since the mid 1990s, it was recommended that the total allowable catch be reduced for the 2001/2002 fishing year, which began August 1, 2001. The recommended yield range was 2,100 to 2,800 metric tons based on harvest rates of 0.06 to 0.08 as measured by the tag-recovery analysis. The harvest rates were selected from the low end of a range determined to be appropriate for sablefish using a modified spawning biomass per recruit model by Haist et al. (2001). Managers adopted a quota of 2,800 t for 2001/2002, which entailed in-season reduction of the 3,600 t sablefish allocation of the original 4,000 t quota for all fisheries. A quota of 2,450 t was adopted for the 2002/2003 fishing year and the stock will be re-assessed in early 2003.

iii. Issues

Routine ageing of sablefish has not been conducted in B.C. since 1997, although structures have been collected. Plans for 2002/2003 include conducting comparative studies between the break-burn and thin-section methods of otolith preparation to determine whether uncertainties in ageing can be resolved.

The Joint Project Agreement for sablefish stipulates that science programs be reviewed every three years by an independent panel. The first such Triennial Review is tentatively scheduled for the fall of 2002 and should provide direction for subsequent assessment and research efforts.

Publications:

- Haist, V., Hilborn, R., and M. Wyeth. Sablefish stock assessment for 2001 and advice to managers for 2002. Can. Sci. Advisory Res. Doc. 2001/135. 54p.
- Kronlund, A.R. and K.L. Yamanaka. 2001. Yelloweye rockfish (*Sebastes ruberrimus*) life history parameters assessed from areas with contrasting fishing histories. In Spatial processes and management of marine populations. University of Alaska Sea Grant, AK-SG-01-02, Fairbanks.
- Kronlund, A.R., M. Wyeth, and R. Hilborn. 2002. Review of survey, commercial fishery, and tagging data for sablefish (*Anoplopoma fimbria*) in British Columbia. PSARC Working Paper G2002-01.
- Schnute, J.T. and A.R. Kronlund. 2002. Estimating salmon stock-recruitment relationships from catch and escapement data. Can. J. Fish. Aquat. Sci. 59: 433-449.

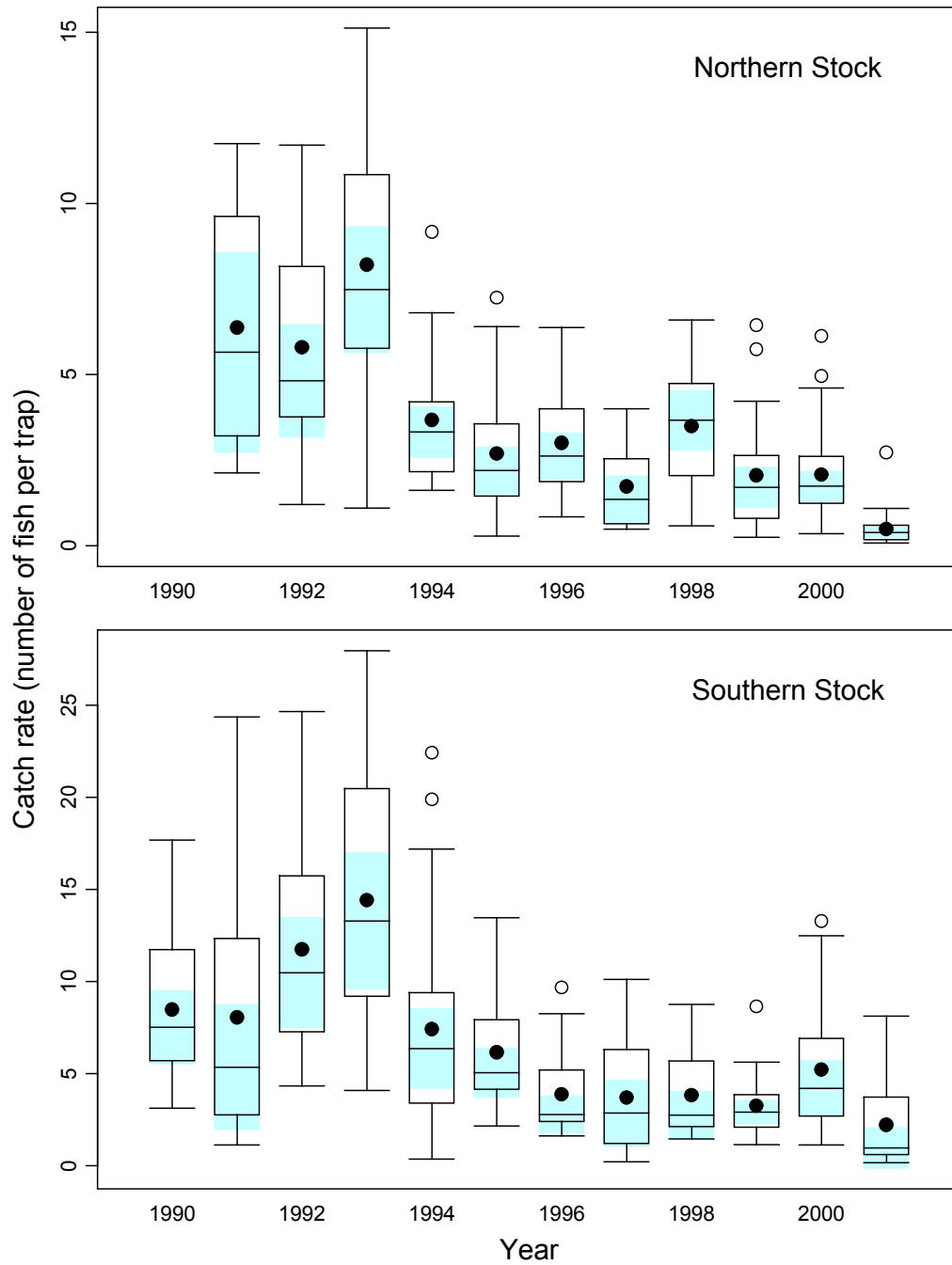


Figure 1. Distribution of sablefish survey catch rates (number of fish per trap) for each set by year and stock. Boxplots show the distribution of catch rates observed on each set. The filled circles show the mean annual catch rate. The lightly shaded rectangle indicates an approximate 95 percent confidence interval on the median annual catch rate.