

STATUS OF CALIFORNIA'S BOCACCIO STOCK

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ABSTRACT

Bocaccio rockfish, typically comprise 45-50% of the INPFC Monterey Area trawl landings, but are of lesser importance in the Eureka and Conception Areas. Other commercial gear and the sport fishery also catch significant amounts of bocaccio. Estimated Monterey Area landings have remained consistently below the harvest guideline of 4100 mt during the 1977-1984 period.

Summarized annual catch data (1978-1982) show that 90% of the catch consist of fish between 2 and 10 years old and that 60% of the catch consist of fish between 3 and 5 years old. Age composition data also demonstrates the progression of the extremely strong 1977 year class through the fishery.

Preliminary biomass estimates suggest that the standing stock off California is somewhere in the 10,000 to 20,000 metric ton range, considerably above previous estimates.

Because there is no indication that a year class with the strength of the 1977 year class has been recruited to the fishery, landings will probably drop in the near future. Since the feature of the periodic occurrence of an exceptionally large year class confounds the establishment of a single value MSY for bocaccio, no changes are recommended for ABC at this time. However, the fishery must be followed closely and managed with the points of concern mechanism.

Bocaccio, Sebastes paucispinis, are important components of California's sport and commercial fisheries. Sport fishermen caught an estimated 1043 and 1461 mt of bocaccio in 1981 and 1982, respectively (U.S. Department of Commerce 1984), while the trawl fishery landed considerably more, 3429 mt in 1981 and 3818 mt in 1982 (Table 1). Other gear types, such as set nets and set lines take lesser amounts that are presently difficult to quantify.

Trawl caught bocaccio rockfish, the majority of California's landings, fall in the general or unspecified rockfish landing categories in each of the three INPFC California Areas. They typically comprise 45-50% of the Monterey Area trawl catch, but are of lesser importance in the Eureka and Conception Areas. A joint NMFS-CDFG market sampling program initiated in 1977 has provided estimates of bocaccio landings by INPFC Area (Table 1).

Monterey Area landings (Figure 1) increased considerably during the period (1977-1984) but remain below the harvest guideline of 4100 mt established by the GMT. There are no ABCs set for the Eureka Areas, however combined sport and commercial landings within the Conception Area are probably near that area's ABC of 2000 mt.

BOCACCIO AGE COMPOSITION

A bottom trawl survey conducted by the National Marine Fisheries Services Northwest and Alaska Fisheries center during the summer of 1977 (Wilkins 1980), found that relative abundance peaked at age 4 then declined regularly through age 11. Summarized annual catch data (1978-1982) show that 90% of the trawl catch by number, consist of fish between 2 and 10 years old, and that 3-5 year old fish comprised 60% of the landings. Relative age composition between 1978 and 1982 (Figure 2) show a fishery sustained by an exceedingly strong 1977 year class. Since this species attains a maximum age of about 30 years it is obvious they are heavily exploited.

POPULATION ESTIMATES

Electrophoretic studies (Wishard 1980) and age composition data (Wilkins 1980) suggest that Bocaccio from at least Pt. Conception north, comprise one stock group. Therefore, since nearly all the trawl fishery takes place north of Pt. Conception, the following analysis uses combined data from each of the three California INPFC statistical areas.

Prior biomass estimates for the Monterey Area (Table 2) derived from data collected by NMFS bottom trawl surveys in 1977, 1980, and 1983 (Jow 1985) appear to underestimate the actual standing stock. The estimated Monterey Area trawl catches (Table 1), are approximately 2/3 of the NMFS biomass estimate.

Preliminary population and biomass estimates derived from catch at age data using the Murphy method (Tomlinson, 1970) suggest that the standing stock is considerably larger than the NMFS estimates (Table 3). Minimum and maximum starting F values of .2 and .5 were used for all year classes. Natural mortality was fixed at .25. The results indicate average standing stocks somewhere between 19268 mt at $F=.2$ and 11006 mt at $F=.5$.

While the total biomass remains relatively stable during the study period, the population estimates (number of fish) shows a steady decline. This pattern clearly demonstrates the importance of the 1977 year class to the fishery and portends a sharp drop in landings as that cohort leaves the fishery.

DISCUSSION

Th increased bocaccio landings during 1981-1984 period coincides with a general increase in effort directed toward rockfish and the increased use of roller-gear by the state's trawl fleet. However, these preliminary results suggest that the landing statistics are more reflective of the domination of the 1977 year

class than the increased effort and efficiency. The recruitment of this year class as 2-and-3 year olds apparently diverted effort away from older year classes, which are distributed in deeper water, thereby complicating more detailed analysis.

Since there is no indication that a similarly strong year class has since been recruited, near future landings will most probably undergo a decline. First quarter 1985 landings show a sharp drop as do third and fourth quarter 1984 landings, however more data is needed to establish a trend. There are reports that the 1985 year class is the largest since the 1977 year class. These fish would be expected to bolster landings in the late 1980's and early 1990's.

The feature of the periodic occurrence of an exceptionally large year class confounds the establishment of a single value MSY for bocaccio. The latest population estimate (Table 3) is that for 1982 and the trend of declining population size occurred for the data set. However, the NMFS survey data indicate a larger relative population in 1983 (Table 2). Age analyses with 1983 and later data can resolve this discrepancy. Additionally, it will add considerably to our knowledge of the stock and provide for sounder recommendations for yield levels.

No changes are recommended for ABC although the fishery must be followed closely and managed with the points of concern mechanism.

APPENDIX 4
Bocaccio

Table 1. Estimated trawl bocaccio landings in mts by INPFC area.

Year	Eureka	Monterey	Conception	Total
1977	55	1,748	a/	
1978	140	1,595	a/	
1979	65	2,313	a/	
1980	107	2,567	889	3,563
1981	369	2,495	564	3,428
1982	630	2,462	726	3,818
1983	300	2,827	310	3,437
1984	173	2,796	218	3,187

a/ Data not available.

Table 2. Biomass estimates (t) for bocaccio rockfish in the INPFC Monterey area from NMFS bottom trawl surveys in 1977, 1980, and 1983 (from Jow, 1985).

Year	Shallow	Deep	Total
1977	a/	a/	4,980
1980	3,017	749	3,766
1983	892	5,558	6,450

a/ Data not available

Table 3. Estimated population size in numbers and weight.

Year	Millions of Fish	Metric Tons
<u>F = .5</u>		
1978	21.9	13,279
1979	17.9	12,517
1980	12.7	11,297
1981	9.2	10,241
1982	5.5	7,695
Average		11,006.2
<u>F = .2</u>		
1978	35.8	20,141
1979	30.6	20,339
1980	22.6	19,840
1981	17.5	19,217
1982	12.0	16,807
Average		19,268

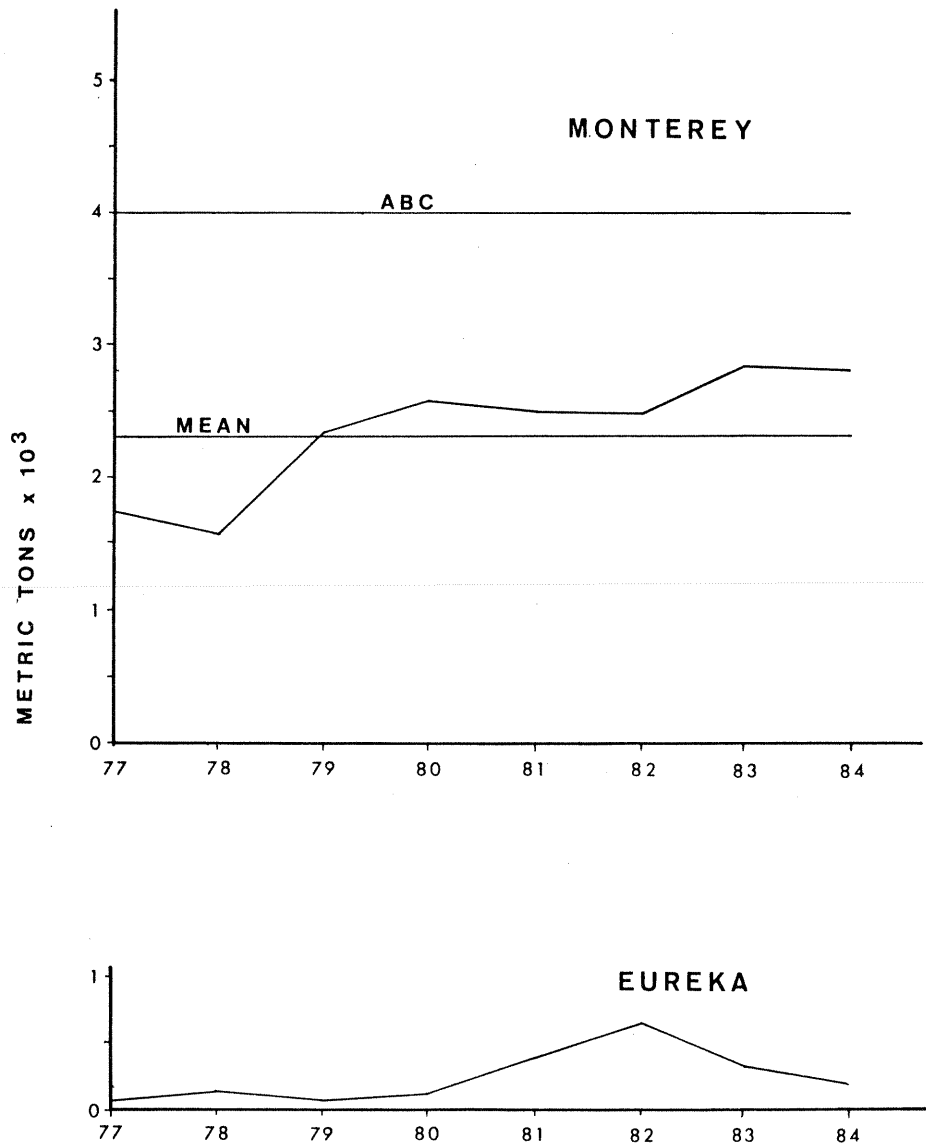


Figure 1. Monterey and Eureka INPFC area estimated trawl bocaccio landings, 1977-1984.

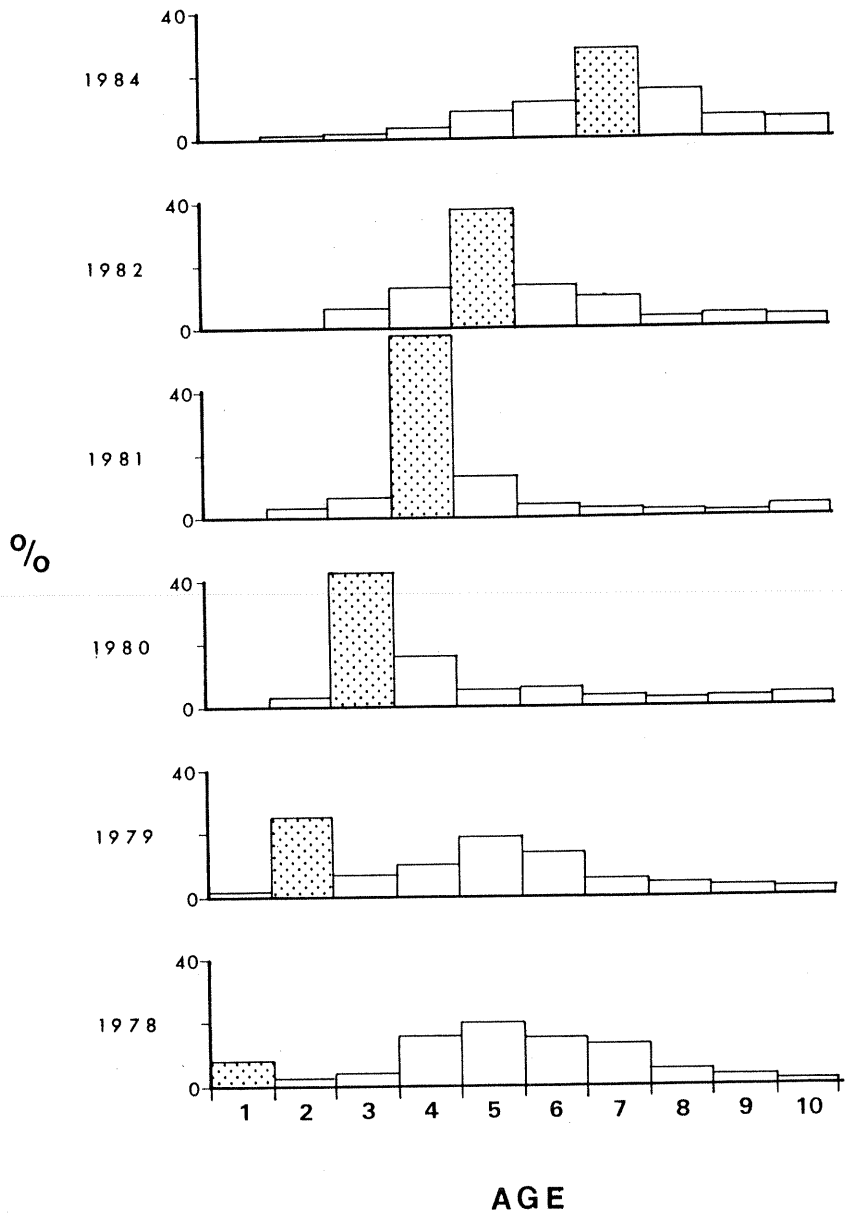


Figure 2. Estimated age composition of trawl caught bocaccio rockfish in California, 1977-1982, 1984 (stippling denotes 1977 year class, 1983 data not available).

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