

POTENTIAL CATCH OF THE PRESENT SAN PEDRO WETFISH FLEET

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INTRODUCTION

We were asked to comment on the potential catch of the San Pedro wetfish fleet as based on past performances and reflected in our catch and effort data.

After evaluation of the large amount of data available we tabulated catch and effort from each log on a weekly basis by general fishing areas. We utilized fishing log data from 1968 and most of 1969, at least as much of it as time allowed. The work we did made it quite clear that a great deal more effort will have to be directed toward the collection and processing of log interview data.

By law, vessels fishing the northern anchovy, *Engraulis mordax*, for reduction are required to submit a record of fishing operations when landing their catch. Thus, the anchovy log program reflects effort from successful trips very well but reporting unsuccessful trips, which at times may be significant, is incomplete. Our log program will also require a great deal of additional effort to ensure that unsuccessful trips for mackerel (Pacific mackerel, *Scomber japonicus* and jack mackerel, *Trachurus symmetricus*), Pacific bonito, *Sarda chiliensis*, bluefin tuna, *Thunnus thynnus*, and other species are properly reported. Therefore, the catch per unit effort figures and other data presented must be considered preliminary and subject to possible change as a result of more complete analysis.

PRESENT FLEET

In 1947 the San Pedro wetfish fleet was made up of about 250 vessels. This fleet fished primarily for the Pacific sardine, *Sardinops caeruleus*. Shortly thereafter, the sardine fishery collapsed and by 1954 the fleet had shrunk to 137 boats. Ten years later only 54 boats remained in the fleet. At present the fleet includes but 29 active vessels. These range in registered length from 39 to 80 feet and can carry from about 25 to 150 tons of fish. An additional six vessels normally fish for tuna in tropical waters but occasionally fish for bonito and tuna (primarily bluefin tuna) locally and might enter the wetfish fishery under certain conditions. These vessels are 80 to 90 feet long and have a capacity of about 120 to 180 tons.

The daily capacity of the wetfish fleet as based on loads of anchovy is 2,450 tons. Our log book data, in-

terviews, and landing figures show that the boats operate for an average of 15 or 16 days per month. This figure takes into consideration time lost to inclement weather, repairs, and rest periods. It does not include time lost because of strikes and other economic problems. At a fleet capacity of 2,450 tons and 15 operating days per month, the monthly capacity of the fleet is 36,750 tons. The annual capacity is 441,000 tons.

ASSIGNMENT OF EFFORT

We are quite aware of the problems inherent in assigning effort in a multi-species fishery, and plan to spend a great deal more time on this problem.

For the purpose of developing estimates of the potential catch of the wetfish fleet we computed catch per hour of scouting time for the San Pedro fleet during 1968 and most of 1969. The basic catch and effort data were obtained by our log and log-interview programs conducted in conjunction with routine age and length sampling at the waterfront. Skippers fishing for anchovies are required to make out a fishing log when landing their catch. Fishing and scouting information pertaining to jack mackerel, Pacific mackerel, sardines, bonito, and bluefin tuna are obtained each day through interviews with vessel skippers as they unload their catch or when they dock at San Pedro after an unsuccessful trip. Due to lack of manpower we have not been able to follow completely the daily activity of each vessel in the fleet; however, we believe that in most months we have obtained logs for about 90 percent of the fleet activity, especially during 1968.

Log catch and hours of scouting were summarized on a weekly basis for each month by general fishing areas. Fishing effort was assigned as either being (i) jack and Pacific mackerel, (ii) anchovy, (iii) bonito, and (iv) tuna (bluefin and albacore, *Thunnus alalunga*). We established 12 general areas off southern California and 1 for northern Baja California. Fishing effort was assigned on the basis of the species composition of the catch in a general area during the weekly summary. For example, if only mackerel were taken in an area, all effort in that general area was classified as mackerel effort. If only bonito were taken, the effort was classified as bonito effort. Occasionally both bonito and mackerel were taken in a general area, and when one or the other did not dominate by at least 80 percent of the weekly catch, the effort was not utilized in the catch-effort summation. During 1968 very little effort had to be eliminated for this

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TABLE 2
HYPOTHETICAL EFFORT ALLOCATION
Based on 1968 and 1969 Log Data
(Assumes availability and catchability equivalent to 1968 and 1969, also assumes good economic conditions and demand for fish)

	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
						Percent Allocation						
Mackerel-----	50	50	50	50	50	90	30	30	30	35	45	45
Bonito-----	20	20	20	20	20	10	30	30	10	10	10	10
Anchovy-----	30	30	30	30	30				20	35	45	45
Tuna-----	--	--	--	--	--	--	40	40	40	20	--	--
						Hours of Scouting						
Mackerel-----	1,015	943	1,015	1,015	1,160	2,506	1,114	1,114	835	812	979	914
Bonito-----	406	377	406	406	464	278	1,114	1,114	278	232	218	203
Anchovy-----	609	565	609	609	696	--	--	--	557	812	979	914
Tuna-----	--	--	--	--	--	--	1,484	1,484	1,114	464	--	--

Fleet gross 2,450 tons/day
 36,750 tons/month
 441,000 tons/year
 Ave. 15 days fishing/month
 Ave. 5 hours scouting/day
 29 purse seiners

summer closure, the present fleet could conceivably catch approximately 210,000 tons of anchovies per year. If they fished for mackerel and tuna during the May 15 through September 14 period (closed to anchovy fishing for reduction) they could potentially catch 12,000 tons of mackerel and 700 tons of tuna. In conjunction with mackerel scouting they could bring in 2,300 tons of bonito. As based on 1968 data this would assume complete effort on mackerel in June and 60 percent effort on mackerel and bonito and 40 percent effort on tuna during July, August, and the first half of September. These estimates, of course, assume equivalent availability as occurred in 1968 and 1969.

A more realistic situation would be to assume the effort allocation itemized in Table 2. This resembles the fleet's effort allocation during 1968 and 1969, and assumes good demand for the northern anchovy. It also assumes equivalent abundance and availability as in the base period. The potential catch under this situation would be 32,000 tons of mackerel, 4,000 tons of bonito, 75,000 tons of anchovies, and 1,200 tons of tuna. The tuna catch could very well reach 2,000 and 3,000 tons, or higher, in some years since the abundance, availability, and catchability of this transoceanic migrant may change significantly from year to year. (Table 2.)

These estimates of potential catch are somewhat hypothetical since their attainment depends on a number of assumptions. These are:

1. Good economic demand.
2. All vessels fish approximately 15 days each month, and average 5 hours of scouting per day.
3. Allocation of effort is as indicated in Table 2.
4. Availability and catchability of the exploited fish stocks is equivalent to the base years.
5. Catch per unit of scouting effort observed during months of base years will be maintained with higher fishing intensity.

COMMENTS ON FISHING STRATEGY

During the process of examining individual logs it became evident that the allocations of effort by certain vessels appear not to have been the most prudent decisions. For example, during August 1968 vessels were spending days scouting for tuna with no catch. A total of 1,520 log hours was spent scouting with a subsequent catch of only 0.2 tons of tuna per scouting hour, or \$60 per hour. Meanwhile, mackerel and bonito received only 1,080 hours of effort combined. Mackerel and bonito catch rates were 3.9 and 1.4 tons per hour respectively. At the prevailing prices paid to the fishermen, this amounts to \$295 per hour of mackerel scouting and \$140 per hour of bonito scouting. Some vessels departed areas of apparently good mackerel fishing (2 to 4 tons per scouting hour) where they had made catches in order to search for tuna with the hope of a bonanza catch. After spending 20 to 40 hours scouting with no success, they returned to quickly make 30 to 50 ton sets on mackerel.

TABLE 3
Dollar Return per Hour of Scouting During 1968
Anchovy—\$17 per ton
Mackerel—\$75 per ton

	October	November	December
Anchovy-----	306	229	218
Mackerel-----	217	262	336

It is also of interest to note that the dollar return per hour of anchovy scouting in 1968 (as based on the price of fish to the fishermen) rivaled the return for mackerel (Table 3).

During 1969 (anchovy price increased to \$20 per ton), the return per hour of anchovy scouting was \$172 for September, \$314 for October, and \$288 for November.

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