REVIEW OF SOME CALIFORNIA FISHERIES FOR 1982[1]

Total California landings for the pelagic wet fisheries decreased slightly during 1982 (Table 1). While landings of anchovy, Pacific mackerel, and market squid declined, jack mackerel and Pacific herring landings almost doubled. Pacific sardine landings, incidental to catches of mackerel, were the highest since the moratorium on their commercial take was established in 1973.

Pacific Sardine

The moratorium on the commercial take of sardines remained in place during 1982, amidst rumors that the resource was resurging. These rumors arose, in part, because Pacific sardines were being seen and taken more frequently during 1982 than in any other year since the moratorium took effect in 1973.

Live-bait fishermen from most southern California ports reported encountering pure schools, and frequently logged incidental catches of sardines while targeting on anchovies. Mackerel fishermen also reported sightings of sardine schools, and the incidental catches of sardines rose to 144 short tons in 1982. Although most of the sightings of sardines were unconfirmed, the California Department of Fish and Game's young-fish, midwater-trawl survey provided additional information regarding the relative abundance of this resource.

The 1982 survey captured sardines in 14 of 152 midwater-trawl tows. Although the total catch of 145 fish was minor compared to the catch of other species (primarily anchovies), this was the best showing of sardines in 17 years of survey trawling in California waters. Another encouraging sign was that nearly two-thirds of the trawl catches consisted of young sardines spawned during 1982.

Northern Anchovy

The year began with 6,795 tons and 135,336 tons remaining to be harvested against the 1981-82 season quotas for the northern (10,000-ton quota) and southern (140,000-ton quota) permit areas, respectively.

In the northern permit area, there were no landings during January, as most fishermen were participating in the highly lucrative herring roe fishery. After the interseason closure (February-March) fishing success remained at a low level, with only a few scattered weeks of sizable landings during April and May. Substantial numbers of fish under the 5-inch size limit began to show up in May's landings and caused one vessel to be cited. By mid-June most of the local fishermen had shifted their efforts to squid or salmon. The season closed on June 30, with total landings of 4,953 tons for the northern permit area (Table 2).

In the southern permit area, a continuing dispute over price and unloading rules between unions, boat owners, and canneries kept most of San Pedro's fleet from fishing for anchovy during January. Only four San Pedro boats fishing for the smaller Terminal Island processor, and

TABLE 1

Landings of Pelagic Wet Fishes in California in Short Tons in 1964-82

Year	Pacific sardine	Northern anchovy	Pacific mackerel	Jack mackerel	Pacific herring	Market squid	Total
1964	6,569	2,488	13,414	44,846	175	8,217	75,709
1965	962	2,866	3,525	33,333	258	9,310	50,254
1966	439	31,140	2,315	20,431	121	9,512	63,958
1967	74	34,805	583	19,090	136	9,801	64,489
1968	62	15,538	1,567	27,834	179	12,466	57,646
1969	53	67,639	1,179	26,961	85	10,390	105,307
1970	221	96,243	311	23,873	158	12,295	133,101
1971	149	44,853	78	29,941	120	15,756	90,947
1972	186	69,101	54	25,559	63	10,303	104,993
1973	76	132,636	28	10,308	1,410	6,031	150,489
1974	7	82,691	67	12,729	2,630	14,452	112,576
1975	3	158,510	144	18,390	1,217	11,811	190,075
1976	27	124,919	328	22,274	2,410	10,153	160,115
1977	6	111,477	5,975	50,163	5,827	14,122	187,570
1978*	5	12,607	12,540	34,456	4,930	18,898	83,436
1979*	17	52,768	29,392	17,562	4,651	18,954	123,434
1980*	38	46,873	32,349	22,225	7,109	16,021	124,615
1981*	31	57,355	42,477	15,513	6,444	24,840	146,660
1982*	144	46,352	31,057	28,908	11,075	17,901	135,437

*Preliminary

[1]Includes review of the pelagic wet fisheries.

TABLE 2

Anchovy Landings for Reduction in the Southern and Northern Areas from 1966 to 1982, in Short Tons

Season	Southern Area	Northern Area	Total
1966-67	29,589	8,021	37,610
1967-68	852	5,651	6,503
1968-69	25,314	2,736	28,050
1969-70	81,453	2,020	83,473
1970-71	80,095	657	80,752
1971-72	52,052	1,314	53,426
1972-73	73,167	2,352	75,519
1973-74	109,207	11,380	120,587
1974-75	109,918	6,669	116,587
1975-76	135,619	5,291	140,906
1976-77	101,434	5,007	106,441
1977-78	68,476	7,212	75,688
1978-79	52,696	1,174	53,870
1979-80*	33,383	2,365	35,748
1980-81*	62,161	4,736	66,897
1981-82*	45,149	4,953	50,102

*Preliminary

the Port Hueneme fleet of four seiners were able to maintain landings through the end of January.

When the season reopened on April 1, no fishing occurred, because negotiations ensued over a new price formula and port rules. Fishing didn't begin until late April, at a price reduced from $46.00 to $41.50 per ton. The fishermen's interest in anchovy steadily increased, and on May 22 they voted to suspend port rules and fish every day (except Memorial Day weekend) until the end of the season. Commercial-size schools of anchovies were found close to San Pedro, and the fleet was able to fish "round-the-clock" until the June 30 season closure. Total landings in the southern area for the 1981-82 season were 45,149 tons, with over 38,000 tons landed from April through June.

Sampling indicated the southern area spring fishery landings comprised 17% 1981 year-class fish, 30% 1980 year-class fish, 42% 1979 year-class fish, with 11% older fish. The contribution of the incoming year class (1981) was less than half that of the previous two seasons' incoming year class during the months of May and June.

On July 1, the U.S. Department of Commerce announced reduction quotas for the 1982-83 season. An egg production estimate of 425,000 tons spawning biomass was calibrated to an "equivalent" larval census estimate of 2,060,000 tons. This resulted in federal reduction quotas of 10,000 tons and 224,000 tons for the northern and southern permit areas, respectively.

The Fish and Game Commission chose to retain the same processing quotas as in the previous reduction season: 10,000 tons for the northern permit area and 140,000 tons for the southern permit area.

The 1982-83 season opened in the northern permit area on August 1, with only two boats fishing for anchovy at a modest pace through October. No landings were made during November because of a lack of commercial-size schools in Monterey Bay. By December most of the local fishermen had left for the lucrative herring roe fishery in San Francisco Bay. A single seiner made one landing of anchovies in mid-December. Total landings for the northern area through December stood at only 1,210 tons, down considerably from the 3,500 tons landed during the same period in 1981.

In the southern permit area, the 1982-83 season opened on September 15, but fishermen showed little interest in fishing for anchovy. The San Pedro fleet concentrated its efforts on mackerel and bonito. The smaller Terminal Island processor did place a "no-limit" order for anchovies with its boats in early November, but the larger processor decided not to place an order, At mid-month a scouting trip by four seiners found commercial-size schools; however, the fish were judged to be too small. No loads of anchovies for reduction were landed at Terminal Island through the end of December.

Seiners based at Port Hueneme began fishing in their local waters for anchovy in mid-October. The sporadic appearance of commercial-size schools, and intermittent storms held down the landings to a total of 1,960 tons through the end of December; these were the only landings for reduction delivered in the southern area.

The total reduction landings for 1982 statewide were 45,109 tons. Additionally, 5,300 tons were landed for live bait and an additional 1,300 tons for other nonreduction purposes. During 1982 the price of anchovy for reduction ranged from $46.00 to $41.50 per ton, much lower than the 1981 price.

Jack Mackerel

After contributing only 27% of combined mackerel landings in 1981, jack mackerel was the dominant species in 1982 landings until late in the year. From January through October jack mackerel accounted for 55% of mackerel landings. However, in November the major cannery at Terminal Island expressed a preference for Pacific mackerel, and jack mackerel landings slackened dramatically. The 1982 total landings of 28,908 tons represent 48% of the total mackerel landings.

The ex-vessel price for both mackerels dropped from $190 per ton to $174 per ton during October. The decrease resulted from negotiations between fishermen and canneries for the purpose of increasing production.

Pacific Mackerel

The year began with approximately 4,000 tons remaining on the 1981-82 season (July 1-June 30) quota of

33,000 tons. On January 31 the allowable catch for the season was increased to 38,000 tons after a reevaluation of the 1981 total biomass estimate. Fishing success was excellent during both January and February, and on March 6 the quota season was closed. Interseason restrictions allowed for a 50% incidental catch with jack mackerel and 3-ton pure loads. The 12-month catch (July 1981-June 1982) of 42,100 tons was the highest "seasonal" catch since 1940-41.

The 1982-83 season opened on July 1, 1982, with a quota of 29,000 tons. This was based on a total biomass estimate of 165,000 tons, which was lower than the previous year's assessment. The reduced biomass level resulted from lower levels of recruitment by the 1979 and 1980 year classes and the projected moderate recruitment of the 1981 year class.

Although mackerel fishing was good during most of the summer and fall, the better availability of jack mackerel and possibly a smaller biomass of Pacific mackerel combined to hold down landings of the latter. It wasn't until November that Pacific mackerel began to predominate in catches, but this appeared to be a direct result of marketing considerations. During the last two months of the year, one cannery at Terminal Island established higher daily boat limits for deliveries that contained 100% Pacific mackerel. This was the first time since the 1950s that a sustained preference for Pacific mackerel had been exhibited by a major buyer.

Landings of Pacific mackerel, against the season quota, reached 19,000 tons at year's end. The age composition of these landings supported conclusions regarding weak recruitment in recent years. Four-year-olds (1978 year class) and older fish accounted for approximately 70% of the tonnage landed between July 1 and December 31, 1982. The 1982 total landings of 31,057 tons represents the first decline in annual landings since the resurgence of the fishery (Table 1).

Market Squid

California's total harvest of market squid continues to result from the operations of two separate fisheries: the late-spring-summer-early-fall fishery of Monterey Bay and the late-fall-winter-early-spring fishery off southern California.

The southern California market squid fishery declined during 1982, with total landings estimated at 6,275 tons, down considerably from the over 10,000 tons landed in 1981. The normal late-fall appearance of schools of squid in southern California waters failed to occur in any numbers comparable to recent years. San Pedro markets received over 90% of their landings of squid during the first 5 months of the year. During December these markets were offering $300-400 per ton for squid because of the market demand, which could not be supplied. The major squid canneries, located at Port Hueneme and Terminal Island, received all of their landings during the first 3 months of 1982.

Purse seine and scoop/dip-net-rigged vessels brought in over 95% of the catch. As in previous years, the greatest amount of squid was taken from waters around Santa Catalina Island and in Santa Monica Bay. The average price paid for squid during 1982 was $110.90 per ton, up about $25 from that paid in 1981.

The 1982 Monterey squid catch was 11,626 tons, and the catch has averaged 11,000 tons over the past 5 seasons. This represents the longest sustained period of high catches since the fishery began, and is only approached by the good catches made during the mid-1940s. The 1982 fishery peaked in May and October, with over half the catch taken in the early part of the season. The ex-vessel price was not increased this season and remained $285 per ton and $115 per ton for freezing and canning, respectively.

Despite the good catches and high prices paid in 1982, all is not well with the Monterey fishery. The bulk of the early season catches comprised either very small squid or squid of poor quality not suitable to be frozen for human consumption. For a short time in August the price was actually lowered to $256 per ton because of this condition. In 1981 the fall squid fishery was the best in recent years, and it is possible that good survival from a "late" 1981 spawn resulted in greater availability of small squid the following spring.

Frozen squid for human consumption has become a major part of the market, along with frozen squid for bait. When inventories of frozen squid were exhausted midway through the season, the fishery could not supply enough quality squid to meet the demand, even though catches were good. Local squid dealers considered 1982 a poor season.

Another problem during 1982 was that the size of the lampara fleet at Monterey increased to over 40 boats. Many of the new boats do not belong to the local fishermen's union, and they fish as they please on weekends and during the light of the moon. The increased fleet size also means smaller daily catch limits per boat, because catches are limited by the capacity of freezing plants.

Finally, unseasonably warm ocean temperatures during the winter of 1982-83 in central California may have a serious impact on the Monterey fishery in 1983. These same conditions prevailed in 1961 and 1973, two of the worst squid seasons on record.

Pacific Herring

The 1982 annual herring catch was 11,075 tons (Table 1). The major component of the catch is from the seasonal herring roe fishery in Tomales and San Fran-

cisco bays. The herring roe fishery season extends from December through March, and the 1981-82 seasonal catch was 11,321 tons. Catches are controlled by a quota system based on annual population estimates. The San Francisco Bay quotas were increased to 10,000 tons in 1981 and resulted in record high catches during the 1981-82 herring roe fishery.

The herring roe fishery is limited to gill nets in all areas except San Francisco Bay, where purse seines and lamparas are also used for herring. The quotas are allocated by gear in order to reduce competition between different gear. Gill net boats were divided into three platoons: the "XH" or December platoon, and the odd and even platoons that fish alternate weeks the remainder of the season. As a result of higher population estimates the San Francisco Bay quota was increased, while all other area quotas remained the same (Table 3). Quotas were taken in all areas except Tomales Bay and Crescent City Harbor. In Tomales Bay the quota was not taken because of the platoon system, which allows only half the fleet to fish each major spawning run. Regulation changes after the 1981-82 season eliminated the platoon system in Tomales Bay and combined the fleet into one group for the 1982-83 season.

The 1982 Tomales Bay herring spawning biomass was estimated to be 7,150 tons; this is the highest estimate in 4 years and reverses a declining trend. The 1982 San Francisco Bay herring spawning biomass was estimated to be 99,500 tons, a 50% increase over 1981, which represents the highest biomass estimate for the bay. These population increases are due to better than average recruitment of the 1978, 1979, and 1980 year classes.

The base price paid for herring catches with 10% roe recovery was $800 per ton for gill net and $400 per ton for round haul. The gill net catch commanded a higher price because it is selective for large herring, which have a higher quality roe. The season's average price, which is dependent on roe content, was $1,200 per ton for the gill net catch and $600 per ton for the round haul catch. The ex-vessel value of the 1981-82 herring roe fishery was over $11 million, and with the stabilization of the Japanese herring market, prices are expected to increase gradually in coming years.

TABLE 3
Permits Issued and Quotas by Area and Gear for the 1981-82 Herring Roe Fishery

Area	Gear	Permits	Quota (short tons)
San Francisco Bay	Gill net (X)	100	1,725
	Gill net (odd)	116	2,070
	Gill net (even)	116	2,070
	Purse seine	24	1,875
	Lampara	27	2,260
Tomales and Bodega Bays	Gill net (odd)	28	600
	Gill net (even)	28	600
	Beach seine	1	—
Humboldt Bay	Gill net	4	50
Crescent City	Gill net	3	30
Total		447	11,280

Groundfish

Groundfish landings continued to increase in 1982, a trend that began in the early 1970s. A new high of 61,440 tons of groundfish was landed. The commercial catch totalled 57,858 tons, and 3,582 tons were taken by recreational fishermen.

The commercial catch was dominated by rockfish, sablefish, and Dover sole. Rockfish was a combination of many species: widow rockfish, bocaccio, and chilipepper rockfish were the most important. Sablefish landings by all gears increased to 10,458 tons. Dover sole landings in 1980 were 10,990 tons, a slight increase over catches of recent years. The most important group in the recreational catch was also rockfish.

In 1982, 177 trawlers participated in the fishery. The majority of the catch, 47,755 tons, was landed by trawlers. The midwater trawl fishery continued to expand; in 1982, midwater trawlers landed 7,735 tons of widow rockfish and 965 tons of Pacific whiting. Trap, line, and gill net fishermen were also active in the groundfish fishery.

The Pacific Fishery Management Council's Groundfish Management Plan was approved and implemented in late 1982. Management actions were taken to curtail widow rockfish and sablefish catches as coastwide, optimum yield levels in the plan were exceeded.

Dungeness Crab

California Dungeness crab landings totaled 10.5 million pounds for the 1981-82 season, a drop of 1.5 million pounds from the previous season.

Landings for Crescent City, Trinidad, Eureka, and Fort Bragg were 6.9, 0.7, 2.5, and 0.2 million pounds, respectively. The northern California season commenced December 1 with intense effort generated by large vessels, many from out of state. Crab condition was good, and by the end of December, 74% of the season's catch had come across the docks. Many vessels quit fishing by mid-January because of low catch rates. Accelerated landings prompted many small vessel owners to petition for trap limits and a ban on night fishing. A total of 432 vessels engaged in the fishery, and the opening price of $.79 per pound quickly jumped to $.89, then progressed to a high of $1.40 by the end of the season.

San Francisco area Dungeness crab landings totaled

just 199,548 pounds, the lowest catch on the record, which dates back to 1916. The previous low was the 1974-75 season when 231,000 pounds were landed. Approximately 100 vessels participated in the fishery. Opening price was $1.25 per pound; it dropped to $.95 in December and climbed steadily to $1.80 by the end of the season.

Pelagic Shark and Swordfish

During the first half of the 1982-83 season, 184 permits were issued to fishermen to take sharks with gill nets. A total of 330 permits were issued to swordfish harpoon fishermen.

In September the passage of SB 1573 (Beverly) voided all previously issued drift gill net permits. Subsequently, the number of new drift gill net permits has reached 183. Under this new permit, swordfish as well as sharks may be targeted by drift gill net fishermen.

The 1982 season has been another poor one for swordfish harpoon fishermen. Just over 1,000 swordfish were taken by the harpoon fleet, compared to the historic average of about 6,000 fish. Despite the poor showing by harpooners, drift gill net fishermen enjoyed a successful late season, accounting for over 12,000 swordfish for the period from July through January, and indicating the presence of large numbers of subsurface fish in southern California waters.

Ex-vessel prices for swordfish during 1982 ranged from $4.00 per pound in July down to $2.50 per pound during the peak month, November.

This year, for the first time, drift gill net vessels have ventured north of Point Conception. A group of drift gill netters working the Morro Bay area produced substantial landings of thresher sharks. During October several vessels were reported fishing as far north as Monterey.

Thresher shark landings have been good this year, dispelling fears that fish stocks might immediately suffer as a result of current levels of fishing pressure. Thus far, there is no evidence of overfishing, indicating that the thresher stock may be quite large and that the drift gill net fleet does not have access to major portions of it.

The price of thresher shark fluctuated throughout the season between $.70 and $1.00 per pound.

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