

A brief look at regional fish-price fluctuations since 1941.

Fish Prices: Historical Trends in Southern California Commercial Fisheries

GARY STAUFFER, ALEC MacCALL, and BRUCE WAHLEN

ABSTRACT—*Ex-vessel prices for southern California commercial fishery resources are reviewed for the period 1941 to 1972. The annual average prices were deflated by the wholesale price index. Prior to 1960 the ex-vessel prices for wetfish species, Pacific sardine (*Sardinops caeruleus*), Pacific mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), northern anchovy (*Engraulis mordax*), and market squid (*Loligo opalescens*), were dominated by the scarcity of sardines and Pacific mackerel. Anchovy prices in the mid-1960's declined as the result of the instigation of a reduction fishery. More recently, anchovy prices have increased as a result of the collapse of the Peruvian anchoveta fishery. Prices for the tunas—yellowfin tuna (*Thunnus albacares*), skipjack tuna (*Katsuwonus pelamis*), bluefin tuna (*Thunnus thynnus*), and albacore (*Thunnus alalunga*)—surged upward with post-World War II inflation, but domestic prices dropped in the mid-1950's due to Japanese imports of frozen and canned tuna. Prices in the 1960's increased with expansion of the world tuna market. The market for the U.S. production of Pacific bonito (*Sarda chiliensis*) was taken over by Peruvian imports in the mid-1950's and domestic ex-vessel prices declined. By the mid-1960's, Peruvian imports had decreased, bonito prices increased, and the U.S. fishery was rejuvenated. The market fish, the larger migratory coastal species—yellowtail (*Seriola dorsalis*), white seabass (*Cynoscion nobilis*), California barracuda (*Sphyrna argentea*), and the less migratory rockfishes (*Sebastes* spp.)—are sold fresh and frozen in local retail fish markets. Prices for this group have been relatively constant except during periods of increased availability.*

Gary Stauffer is with the Southwest Fisheries Center, National Marine Fisheries Service, NOAA, La Jolla, CA 92038. Alec MacCall is with the California Department of Fish and Game (present address: Southwest Fisheries Center, National Marine Fisheries Service, NOAA, La Jolla, CA 92038). Bruce Wahlen, with the NMFS Southwest Fisheries Center, is now employed by the Naval Electronic Laboratory, Naval Personnel Research and Development Center, San Diego, CA 92152.

INTRODUCTION

Fish prices, like other high-protein food prices, have been rising drastically in recent years. Conditions of limited supply, increasing demand, and increasing operating expenses, appear to be fundamentally responsible for this rise in prices, which, spurred on by inflation, is quickly putting many kinds of fish in the category of luxury foods. While recent changes in prices tend to be most easily remembered, price and catch histories of various

species of fish commonly landed in southern California show many interesting fluctuations over the years. An examination of these time series reveals some of the many considerations which determine the price of fish paid to fishermen (ex-vessel price). These price and catch histories are presented with little more than a brief discussion of trends and events which appear to have been influential. For detailed technical analyses see Perrin and Noetzel (1970) and O'Rourke and DeLoach (1971).

Commercial fish transactions in California require sales receipts recording such information as species, quantity, and price. The information on these landings receipts is processed by the California Department of Fish and Game and is published annually as a Fish Bulletin entitled *California Marine Fish Landings*. Included are extensive tables of catch information such as species, location of landings, poundage, and value. Average prices paid for fish landed were calculated by dividing total value by total California landings. This average will tend toward the price paid for the largest quantities of fish, and may not reflect prices paid in periods of low landings.

Since the purchasing power of the dollar was generally falling during the period 1941 to 1972, the prices have been deflated by the wholesale price index (all commodities) with 1941 as the base year¹. By adjusting for inflation in this way, comparison of fish prices between years is more meaningful, particularly during the post-World War II and recent inflationary periods (Fig. 1). Discussion of prices will generally refer to adjusted prices. The scale of prices changes from graph to graph in order to present the most possible detail.

For convenience we have divided the fish species into three broad categories: wetfish, the tunas, and market fish. Species in the same category tend to share traits such as similar (or identical) fishing fleets, processing, and marketing, and thus often show similar price relationships. Some species such as market squid do not conveniently fall into any category while Pacific

¹See "Economic Report of the President," transmitted to the Congress January 1973 together with the annual report of the Council of Economic Advisors (Table C-48).

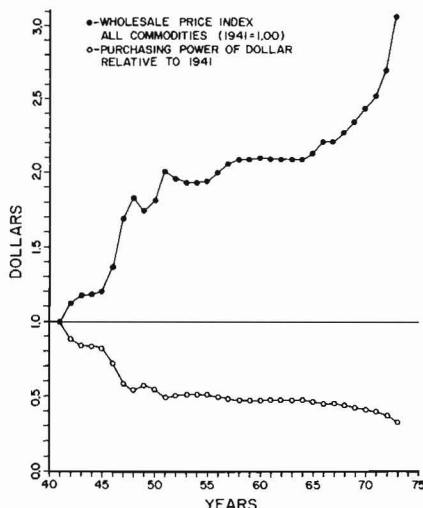


Figure 1.—Wholesale price index for all commodities standardized to U.S. \$1.00 for 1941.

bonito and California yellowtail could possibly be included in more than one category.

WETFISH

The wetfish group is composed of the Pacific sardine (*Sardinops caeruleus*), Pacific mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), northern anchovy (*Engraulis mordax*), and market squid (*Loligo opalescens*). The term "wetfish" derives from the procedure employed in canning these species: the fish is first packed raw, sealed in the can, and is afterward cooked and sterilized by heat. The processing equipment is the same for all these species, allowing considerable interchangeability in the species accepted by the canneries, particularly between sardines, Pacific mackerel, and jack mackerel. The wetfish species are similar in habitat and behavior, tending to school in open waters in the southern California bight, and are fished interchangeably by a specialized local purse-seine fleet. In the early 1940's, a large segment of the wetfish fleet operated out of Monterey, but collapse of the northern sardine fishery led to consolidation of the fleet in San Pedro.

Pacific Sardine

In the 1930's and 1940's the Pacific sardine (Fig. 2) supported one of the largest fisheries in the world, but a long period of decline, punctuated by brief recoveries, led to final collapse of the sardine stocks and fishery in the 1960's.

The sardine industry had an extensive market as well as an immense investment in processing equipment, resulting in prices that were very sensitive to changes in availability. The degree to which the sardine dominated the wetfish industry is reflected in the trends in the prices of the other wetfish during the sardine shortages of 1948, 1953, and 1957. By the early 1960's the foreign sardine markets were lost to African and Japanese suppliers who sold at prices considerably below production costs in California. Since the mid-1960's, sardines have been frozen for sport fishing bait which commands a much higher price than fish destined for canning. A fishing moratorium, including use for bait, has been in ef-

fect in California since 1973, with catch taken incidental to other fishing operations going for canning and reduction only.

Pacific Mackerel

The Pacific mackerel (Fig. 3) fishery and market was conducted independently of the overshadowing sardine industry, although in times of sardine shortage, Pacific mackerel was the first alternative. While the main gear was the purse seine of the wetfish fleet, an independent "scoop" fleet² sometimes accounted for over half the annual

²The "scoop" fleet harvested Pacific mackerel by attracting them with a slurry of ground sardines or anchovies (called chum) and scooping up the feeding mackerel with large hand-held dip nets.

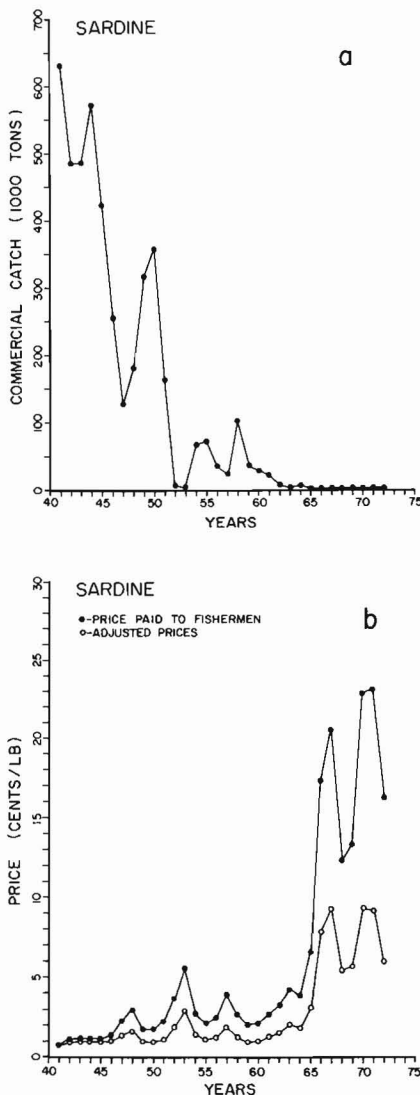


Figure 2.—Annual Pacific sardine a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

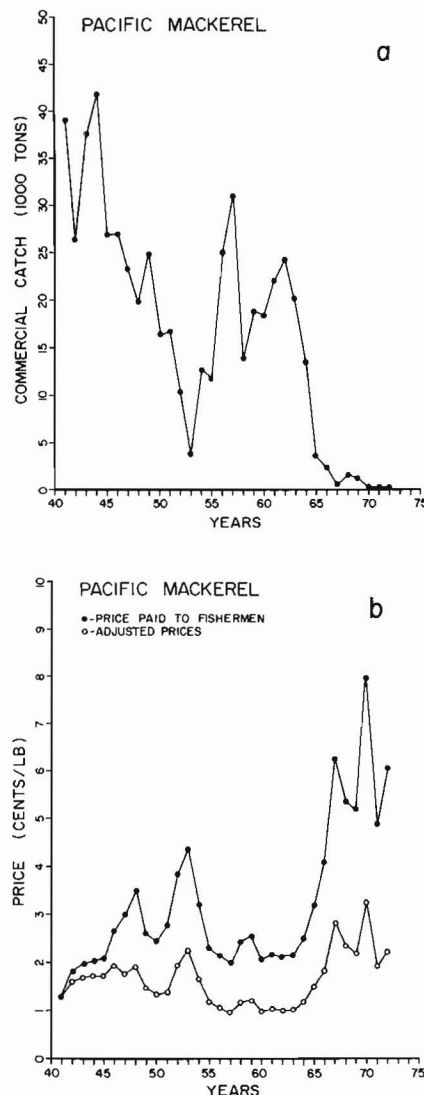


Figure 3.—Annual Pacific mackerel a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

catch. The extreme shortage in 1953 coincided with a sardine shortage, resulting in record prices. Pacific mackerel were also sold to fresh fish markets in small quantities, fetching prices considerably higher than those paid by the canneries. The Pacific mackerel fishery also experienced collapse in the mid-1960's, aggravating wetfish processor difficulties arising from the loss of the sardine fishery. A moratorium on the take of Pacific mackerel has been in effect since 1970, with the small incidental catch going to the fresh fish markets.

Jack Mackerel

Jack mackerel (Fig. 4) were first fished heavily during the sardine shortage that started in 1947. Generally, the industry did not discriminate between the two mackerels and set the same price for both species, with an occasional premium on Pacific mackerel. Once jack mackerel was shown to be an acceptable substitute in the sardine and Pacific mackerel market, it took on the role of filling in shortages of the more desirable species. With the continued decline in preferred species, local jack mackerel resources were quickly used up, and the fishery expanded to the offshore islands and banks of southern California where nearly all catches are now made. Jack mackerel, which is also used extensively in pet food manufacture, is now the main wetfish canned in California. The price peaks prior to 1955 were stimulated by occasional short supplies of sardines and Pacific mackerel. These shortages encouraged greater jack mackerel harvests. On the other hand the price rise in the mid-1960's is a market response to decreased availability of both Pacific mackerel and jack mackerel.

Northern Anchovy

Canning of anchovies (Fig. 5) "sardine style" was attempted during the sardine shortage of the mid-1950's, but this was discontinued by 1958 due to processing difficulties and poor consumer acceptance. The low price in the late 1950's reflects low demand. While making a good pack, anchovies could not be marketed under a "sardine" label, and the California species was too large for acceptance in European markets. In view of the extreme abundance of the species and the economic

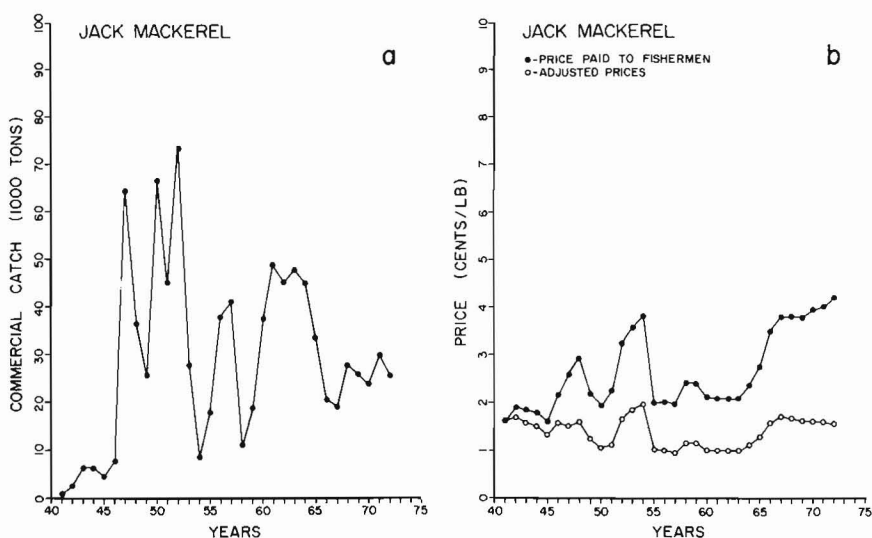


Figure 4.—Annual jack mackerel a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

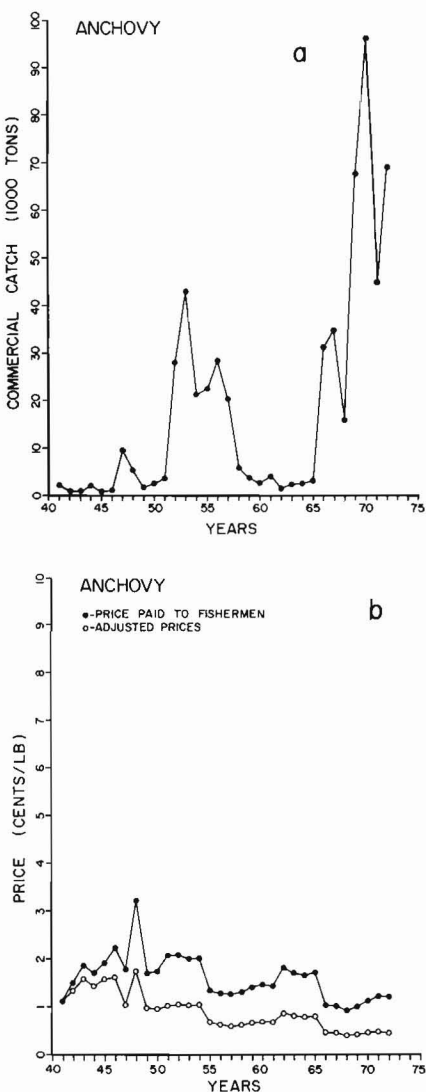


Figure 5.—Annual northern anchovy a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

plight of the wetfish fleet, an experimental reduction³ fishery was initiated amid much controversy in 1965. With this decision, landings quickly increased and prices decreased, being dictated by world fish and soybean meal prices. A severe world shortage of protein meal arising from the collapse of the Peruvian anchoveta fishery and weather damage to the 1972 U.S. soybean crop caused prices to double and even triple in 1973, returning to inter-

³Reduction is the processing of fish into a high-protein fish meal which is used primarily as feed supplement in the poultry industry.

Loading anchovies into well of a San Pedro wetfish seiner. Photo courtesy of the Los Angeles Times.





Unloading tuna from well of purse seiner in San Diego.

mediate values in 1974 (Kolhonen, 1974).

Market Squid

For many years squid (Fig. 6) have been landed regularly at both San Pedro and Monterey, somewhat independently of the other wetfish species. Squid has maintained an adjusted ex-vessel price of about one cent per pound since 1955. Price peaks occurred in 1952 and 1960 when California production was low. Approximately 90 percent of the U.S. squid production is harvested in California. About half of the annual harvest is canned for export to Mediterranean and Japanese markets.⁴ A large portion of the remainder is sold as bait for recreational and commercial fisheries. A smaller portion is marketed through restaurant and retail fish outlets.

⁴Fishery Statistics of the U.S., 1958-71. (Published as Statistical Digests 49-65 by the National Marine Fisheries Service, NOAA.)

TUNAS

The tuna group includes yellowfin tuna (*Thunnus albacares*), skipjack tuna (*Katsuwonus pelamis*), bluefin tuna (*Thunnus thynnus*), albacore (*Thunnus alalunga*), and the Pacific bonito (*Sarda chiliensis*). These species share the same processing facilities, which are different from those used for wetfish processing in that these fish are cooked prior to canning. Albacore are fished along the Pacific coast from Baja California to British Columbia. Bluefin and bonito are important in local southern California fisheries and are fished by both the tuna fleet and the San Pedro wetfish fleet. Yellowfin and skipjack tuna, which are caught in the tropical waters off the west coast of Central America, are processed in southern California, where much of the fleet is based. Since the decline of the sardine fishery in the late 1940's,

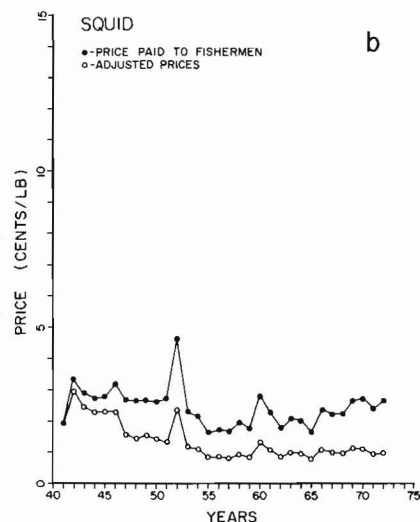
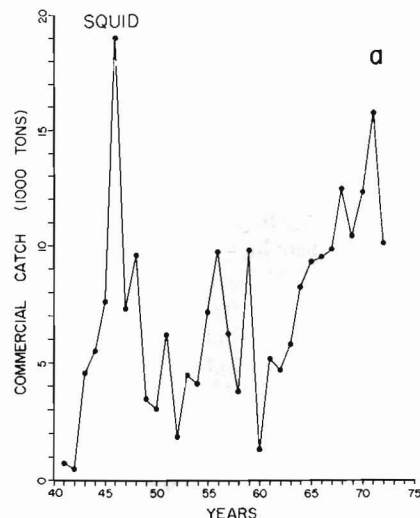


Figure 6.—Annual market squid a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

tuna has dominated the fishing industry in southern California.

Ex-vessel price for yellowfin tuna has generally regulated those of skipjack and bluefin tuna. Albacore prices are established separately from the U.S. yellowfin market, but the two are related through the world tuna market. Fluctuations in ex-vessel prices have been influenced by changes in demand, U.S. imports, and domestic production. More detailed summaries of catch and price information for the U.S. tuna industry are reported in the series "Food fish: Market review and outlook" prepared by the Market Research and Services Division of the National Marine Fisheries Service.

The Office of Price Administration of the Federal government during

World War II set maximum ex-vessel prices and wholesale prices of canned tuna. Generally, supplies were low and prices were high. During the postwar inflationary period, ex-vessel prices jumped to unprecedented levels. These high prices encouraged fishing and increased landings. The expansion of the Japanese high-seas tuna fleet in the mid-1950's had a major impact on the U.S. tuna industry. Imports increased supplies of raw tuna, thereby depressing domestic ex-vessel prices. To market the greater supplies, the canning industry expanded its advertising and merchandising campaigns. These events contributed to the development of a worldwide tuna market in the 1960's.

Yellowfin, Skipjack, and Bluefin Tunas

Historically, the U.S. tuna fishery has been based in southern California. Tuna landings in California, including foreign shipments, increased substantially in the late 1940's as the sardine harvest declined. California landings of raw tuna and the pack of canned tuna for all species have been relatively stable since 1950, while the total U.S. pack has generally increased over the years to the point that the 1970 pack more than doubled the 1950 pack. U.S. tuna deliveries to Puerto Rico and tuna imports from the Japanese fishery to American Samoa account for the major portion of this increase.

The general downward trend in adjusted ex-vessel prices from the postwar period reflect the increasing production of canned tuna⁵. Heavy domestic production and Japanese imports in 1950 resulted in a large inventory carryover and lower prices in 1951. Successful marketing campaigns in the subsequent years helped reduce canners' inventories, and ex-vessel prices increased. Prior to 1953, seasonal tuna prices were negotiated between major canners and leading boat owners, but beginning in 1953, the American Tunaboat Association collectively negotiated the tuna sales. These negotiations resulted in the peak prices of 1954. In the years following, this system became ineffective owing to the increased supplies of imported

⁵The information source for this paragraph is the series of "Pacific Fisherman Yearbooks," 1951-1967.

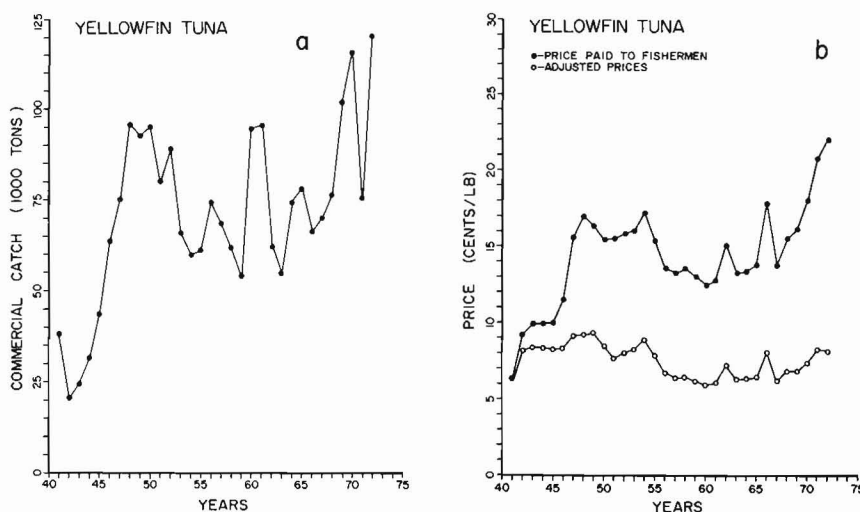


Figure 7.—Annual yellowfin tuna a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

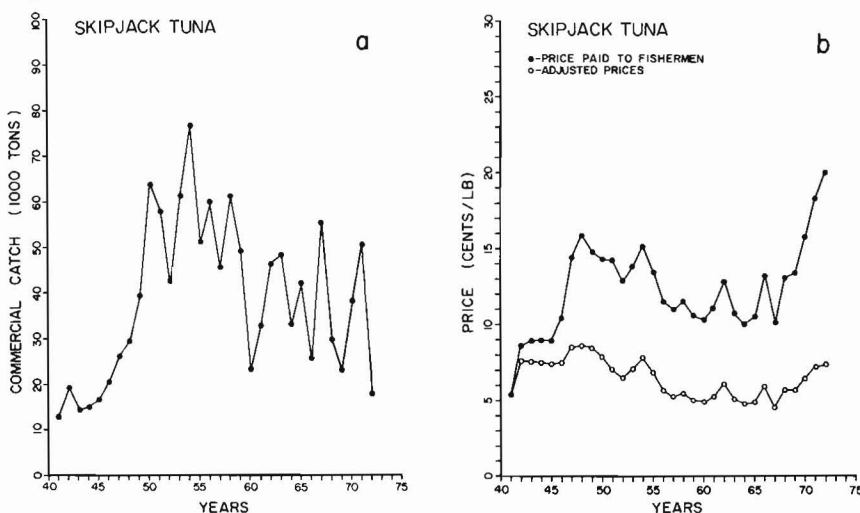


Figure 8.—Annual skipjack tuna a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

tuna, and average prices gradually declined. Imports of frozen tuna doubled between 1957 and 1959. This jump coincides with low prices of 1959 and 1960. The 1962 price buildup began in the latter half of 1961, and the case pack reached an all-time high for California in 1962. With supplies high, ex-vessel prices began dropping in the latter half of 1962. The decline continued into 1963 with large inventory carryovers. These prices continued until the beginning of 1966 when U.S. and import supplies reached an all-time January low. As a result, ex-vessel prices soared to record levels in the first half of 1966. Imports and domestic production of tuna, particularly skipjack, increased to the point that ex-vessel prices

plunged again in 1967. This price drop provided the stimulus that unified boat owners and organized the "empty boat" auction under the American Tuna Sales Association. This auction system has continued to the present time. Ex-vessel prices have increased since 1968, even under increases in the annual production of tuna.

Ex-vessel prices for skipjack and bluefin tuna have almost always been less than those for yellowfin (Figs. 7, 8, 9). Prior to 1952, skipjack prices were routinely 1 cent per pound (\$20/ton) less and bluefin were 0.5 cent per pound (\$10/ton) less. Since then the price differential for skipjack has averaged about 2 cents per pound (\$40/ton). It increased to as much as 4 cents in 1966.

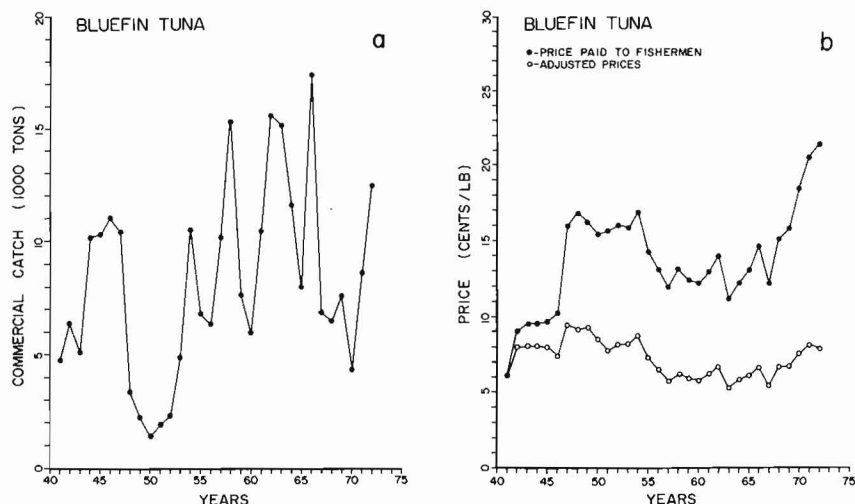


Figure 9.—Annual bluefin tuna a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

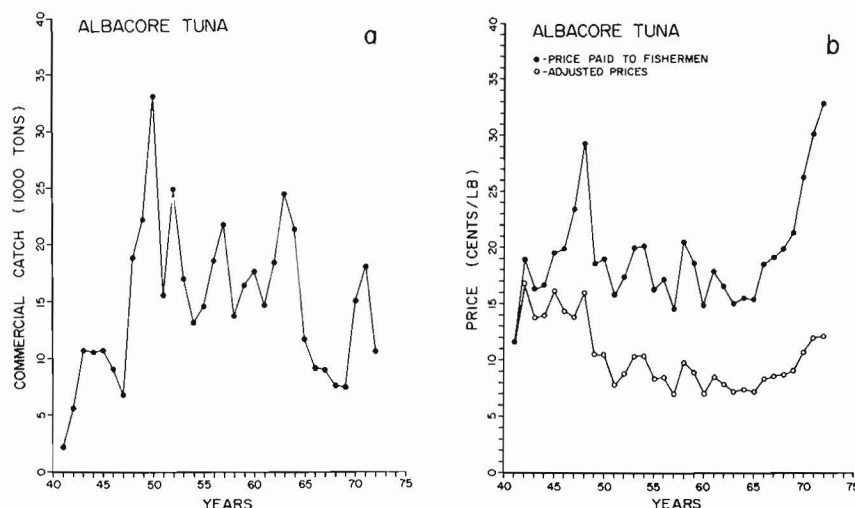


Figure 10.—Annual albacore tuna a) landings in California, and b) average ex-vessel prices paid to fishermen at the buying stations for the years 1941 through 1972.

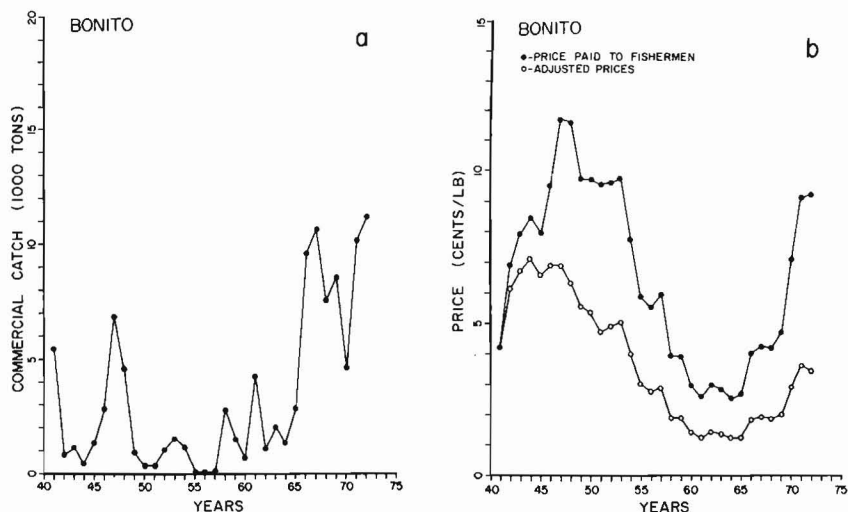


Figure 11.—Annual Pacific bonito a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

The bluefin price differential increased to 2 cents per pound in 1961 and reached a maximum in 1966-67. Since 1968, skipjack price differential has declined from 2.5 to 1.5 cents per pound and the bluefin differential has remained 1 cent per pound.

Albacore

The albacore (Fig. 10) fishery occurs off the Pacific coast from Baja California to British Columbia. Landings in southern California were the major portion of the domestic catch for the years 1948 through 1964. For the other years the major portion was landed in the Pacific Northwest. The geographic location of the fishery has little influence on price trends.

Ex-vessel prices jumped to unprecedented levels during the postwar inflationary period. These high prices encouraged fishing. Good fishing in California in 1950 resulted in a large carryover into 1951, and as the Pacific Northwest fishery did not develop in 1951, canneries imported frozen tuna from Japan to keep the processing plants in operation. As a result of the large inventories, prices declined. During the following 3 years, an expanding market assisted recovery of the ex-vessel prices.

A large-scale surge of imported albacore, both frozen and canned in brine, began in 1955. Domestic albacore prices dropped in response to the increased supplies. The downward price trend continued until 1966. Major price drops of 1955, 1957, 1960, and 1962 correspond to years with increased imports. In recent years imports of frozen albacore have accounted for as much as 75 percent of the white meat tuna canned domestically.

After 1967, a price trend reversal occurred. The increase is due to the general increase in ex-vessel price of all fishery resources, unified collective bargaining by the Western Fishboat Owners Association, continual advertisement and sales promotion, and increased demand for Japanese tuna by other world markets.

Pacific Bonito

Prior to the mid-1950's the major portion of the bonito (Fig. 11) catch was taken in waters off Baja California by purse seiners. Many of these were tunaboats topping off their load with

bonito and yellowtail on their return to southern California ports. During this time, ex-vessel prices reflected those of the other tuna species. As tuna landings increased in the late 1940's, adjusted prices for the less desirable bonito declined. In 1952 tariffs on canned bonito and yellowtail were reduced from 21 percent ad valorem to 15 percent (Pacific Fisherman, 1952, p. 167). Imports from Peru and Chile increased as a result. These added imports tended to further reduce the price paid to southern California fishermen. As a result of the necessity to market the increasing supplies of the more widely accepted white and light meat tuna products in the early 1950's, the industry ceased marketing canned products of the tuna-like species, bonito and yellowtail, and the canned bonito market was taken over by the Peruvian product. Domestic ex-vessel prices declined to a level comparable to that of the wetfishes, and California landings became negligible. Later, a local California purse-seine fishery developed in 1958, probably in response to increased availability in southern California waters. At these low ex-vessel prices the U.S. product was probably competitive with the Peruvian products. As the anchoveta fishery developed in the early 1960's, Peruvian production of canned bonito declined⁶. U.S. imports of Peruvian bonito for 1965-67 dropped to 20 percent of the 1951-59 average and for 1968-70 to 5 percent⁷. In response to price increases, the U.S. fishery expanded considerably to supply the market vacated by the Peruvian bonito. Prices jumped again in 1970 when the availability of bonito off California was down from earlier years. In recent years, tariffs on imported bonito have been reduced twice, from 15 percent ad valorem to 12 percent in January 1969 and to 7.5 percent in January 1972 (Economic Research Laboratory 1973). This has encouraged the importation of Peruvian bonito to 1965-67 levels but has not greatly influenced U.S. prices.

MARKET FISH

The "market fish" group is composed of some of the large predatory coastal fishes: yellowtail (*Seriola dorsalis*),

⁶FAO Yearbook of Fishery Statistics, 1959-73.
⁷Fishery Statistics of the U.S., 1951-70. (Published as Statistical Digests 30-64 by the National Marine Fisheries Service, NOAA.)

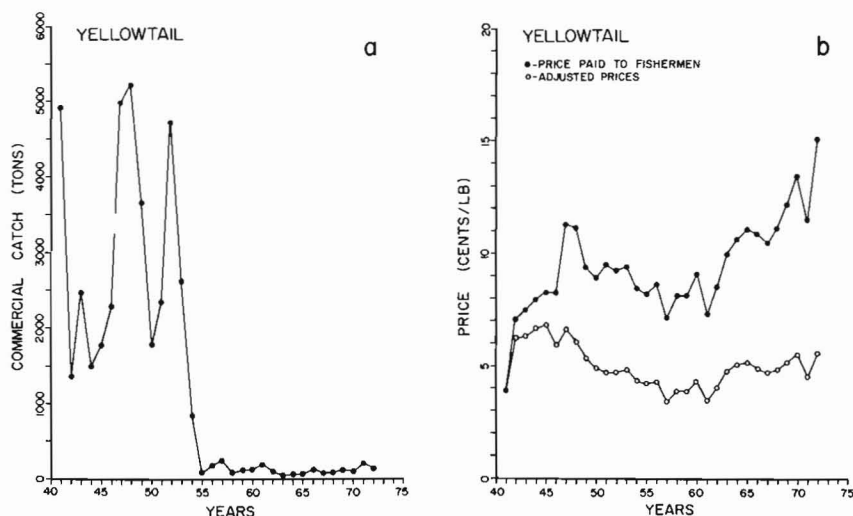


Figure 12.—Annual California yellowtail a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

white seabass (*Cynoscion nobilis*), California barracuda (*Sphyraena argentea*), and the rockfishes (*Sebastes* spp.). These species tend to be sold fresh or occasionally frozen and are utilized locally in southern California, fetching high prices but with relatively small volume. Yellowtail and California barracuda are highly migratory, with the main center of population occurring in Baja California waters. The market species are harvested by a southern California fleet employing gill nets and a variety of hook-and-line gear. Local availability of migratory species in the late spring and summer allows most vessels to concentrate their activities in the southern California area, while in the winter months many boats venture far down the Baja California coast. The years 1957-60 were characterized by extraordinarily warm waters in California, and many migratory species appeared to have shifted their population centers northward. This is reflected in the large local southern California catches of these species. Prices of migratory market species for these years were generally depressed by oversupply.

Yellowtail

The yellowtail (Fig. 12) could be considered a member of the "tuna" group as well as the market fish group. While not a true tuna (family Scombridae) but a jack (family Carangidae), the yellowtail has contributed to the tuna fisheries of California. Prior to 1954, a considerable fishery existed with most fish

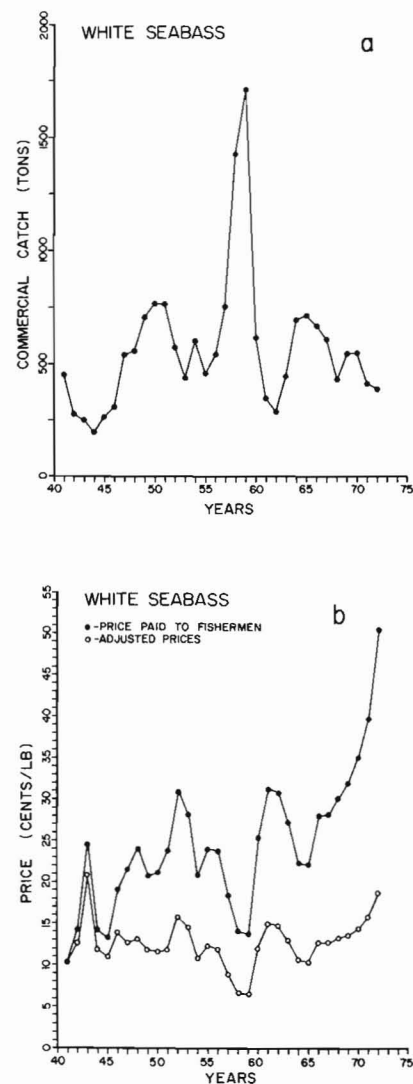


Figure 13.—Annual white seabass a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

caught in waters off Baja California. In the mid-1950's, the industry ceased canning and marketing yellowtail to concentrate on the more profitable tuna products (Baxter, 1960). Subsequently yellowtail became a market fish, being sold primarily as fresh fish, and being landed by the market fleet rather than the tuna fleet. The price has remained rather stable since 1950, showing some tendency to decrease with increases in annual landings for 1957, 1961, and 1971.

White Seabass

The price of white seabass (Fig. 13) has been quite sensitive to annual fluctuations in catch, but has oscillated about an adjusted price of about 12.5 cents per pound with no apparent trend except for the increase in the most recent years. This is one of the highest prices paid for any fish species. It is esteemed for its flavor and has a well-established market demand. Price is for fish gutted with heads on rather than in the round, as is the case for all other species discussed.

California Barracuda

The apparent abundance of barracuda (Fig. 14) has declined substantially since the late 1940's, although commercial catches may overstate this decline since commercial landings are limited to large fish. The party-boat sport catch remained fairly constant in numbers of fish landed (except for the warmwater years), although average size has decreased. The price paid to

commercial fishermen has remained remarkably constant and shown little tendency to rise as catches declined. However, the price did fall when fish were temporarily plentiful in the late 1950's. The recent price increase is characteristic of the general price increase of fishery products and is not necessarily explained by lower production of commercial fish.

Rockfish

The general category of rockfish (Fig. 15) includes many species of the genus *Sebastes*. Depending on the palatability of the species, rockfish are sold either as animal food or as market fish for a higher price (Miller and Hardwick, 1973). The trawl fishery in northern and central California, including Santa Barbara county, lands about 90 percent of the total California harvest. It supplies both the market and animal food industries. The gill-net and hook-and-line fisheries south of Santa Barbara primarily land market species. In order to examine the price history for market species in southern California, only the time series for the smaller southern fishery were included in Figure 15. On the other hand, the northern harvest probably has more impact on the price of market species than the southern fishery, which has gradually increased production since the late 1940's. Prior to 1959, the adjusted price shows a slight downward trend to a low of 4.7 cents per pound in 1958, the year of maximum rockfish

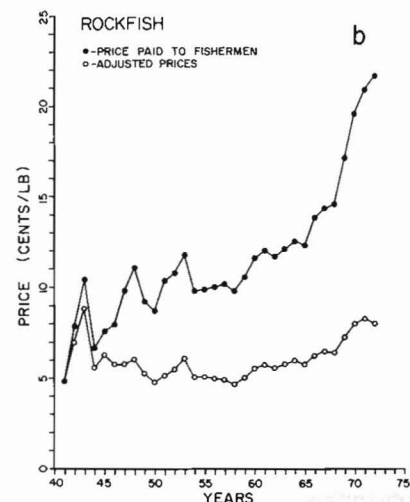


Figure 15.—Annual rockfish a) landings in Los Angeles and San Diego areas, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

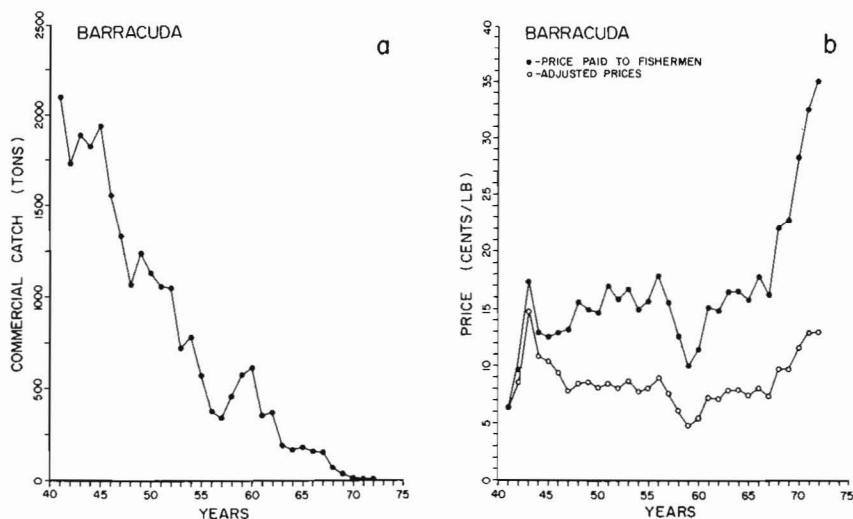


Figure 14.—Annual California barracuda a) landings in California, and b) average ex-vessel prices paid to fishermen for the years 1941 through 1972.

production in California. Since that time, prices have gradually increased with only slight fluctuations as the total catch declined. Increased landings in the most recent years may have dampened the price rise which is apparent in other market species.

SUMMARY

Ex-vessel prices have been deflated by the wholesale price index to account for inflation, particularly during the post-World War II and recent periods. Adjusted prices for all stocks in the 1950's and 1960's are generally lower than those of the 1940's, except for the depleted sardine and Pacific mackerel stocks. In recent years, the price for most species, except anchovy and squid, have increased at a rate somewhat greater than inflation.



Filleting rockfish in Santa Barbara for the fresh fish market. Photo courtesy of biologist Jack W. Schott, California Department of Fish and Game.

The harvest of wetfish species has been primarily influenced by the decline in the sardine stock followed by the Pacific mackerel stock. Prices have been influenced by resource use, i.e., canning, bait, fresh market, or meal reduction. The wetfish species generally have the lowest ex-vessel price of the three groups.

Total California landings of the tuna group have not changed greatly since the early 1950's. California prices have been primarily influenced by the increased world production of tuna and foreign imports of frozen tuna into the United States. Consumer demand in the mid-1950's was less than production and prices tended to sag. In recent

years, worldwide consumer demand has increased and prices have increased. Since the collapse of the sardine stocks, the tuna group has dominated the commercial fishing industry in California.

The market fish group, harvested by a nearshore gill-net and hook-and-line fishery, supplies local demand for fresh fish. Except for the rockfish category, most of the species are migratory along the Baja California and southern California coastline. Prices for this group have been relatively constant except during periods of increased availability. Prices are similar to the tuna group but the catches are considerably less.

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